

**EXHIBIT 13**  
**[FILED UNDER SEAL]**

IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF TEXAS  
Sherman Division

THE STATE OF TEXAS, et al,

Plaintiffs,

vs.

GOOGLE, LLC,

Defendant.

Case Number:

4:20-cv-00957-SDJ

Video Deposition of  
DAVID W. DERAMUS, Ph.D.  
Monday, October 28, 2024  
9:11 a.m.

Reported by: Laurie Donovan, RPR, CRR, CLR

Job No. CS6918935

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<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>6           October 28, 2024</p> <p>7           9:11 a.m.</p> <p>8</p> <p>9           Video deposition of David W. DeRamus, Ph.D.,</p> <p>10 held in person, with the witness and most parties</p> <p>11 participating in person, some participating via Zoom,</p> <p>12 pursuant to the Rules of the United States District</p> <p>13 Court for the Eastern District of Texas, Sherman</p> <p>14 Division, subject to such stipulations as may be</p> <p>15 recited herein or attached hereto, before Laurie</p> <p>16 Donovan, a Registered Professional Reporter and notary</p> <p>17 public of the District of Columbia, who officiated in</p> <p>18 administering the oath to the witness.</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>	<p>1 (Appearances continued)</p> <p>2 ALSO ON BEHALF OF DEFENDANT GOOGLE LLC:</p> <p>3       Freshfields Bruckhaus Deringer US LLP</p> <p>4       700 13th Street, NW, 10th Floor</p> <p>5       Washington, D.C. 20005</p> <p>6       (202)777-4500</p> <p>7       By: Tyler Garrett, Esq.</p> <p>8           tyler.garrett@freshfields.com</p> <p>9 ALSO PRESENT:</p> <p>10       Orson Braithwaite, videographer</p> <p>11       Bryan Richter (remote)</p> <p>12       Daniella Torrealba (remote)</p> <p>13       Luke Woodward (remote)</p> <p>14       Jonathan Jaffe (remote)</p> <p>15       Nathan Baum (remote)</p> <p>16       Nathan Damweber (remote)</p> <p>17       Trevor Young (remote)</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>
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<p>1           A P P E A R A N C E S</p> <p>2 ON BEHALF OF THE PLAINTIFF STATES:</p> <p>3       The Lanier Law Firm, PLLC</p> <p>4       10940 West Sam Houston Parkway North</p> <p>5       Suite 1000</p> <p>6       Houston, Texas 77064</p> <p>7       (713)659-5200</p> <p>8       By: Marc Collier, Esq.</p> <p>9           marc.collier@lanierlawfirm.com</p> <p>10       Zeke DeRose, Esq.</p> <p>11       zeke.derose@lanierlawfirm.com</p> <p>12       Alex Abston, Esq. (remote)</p> <p>13       alex.abston@lanierlawfirm.com</p> <p>14 ON BEHALF OF DEFENDANT GOOGLE LLC:</p> <p>15       Gibbs &amp; Bruns LLP</p> <p>16       1100 Louisiana, Suite 5300</p> <p>17       Houston, Texas 77002</p> <p>18       (713)650-8805</p> <p>19       By: Michael R. Davis, Esq.</p> <p>20       mdavis@gibbsbruns.com</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>	<p>1           E X A M I N A T I O N   I N D E X</p> <p>2                                   PAGE</p> <p>3 EXAMINATION BY MR. DAVIS ..... 8</p> <p>4 EXAMINATION BY MR. COLLIER ..... 310</p> <p>5 FURTHER EXAM BY MR. DAVIS ..... 323</p> <p>6</p> <p>7</p> <p>8</p> <p>9</p> <p>10           E X H I B I T S</p> <p>11 EXHIBIT   DESCRIPTION                   PAGE</p> <p>12 Exhibit 1   Description of apple cart story .   10</p> <p>13 Exhibit 2   Article by Combe, et al, titled</p> <p>14       "Cartels: The Probability of</p> <p>15       Getting Caught in the</p> <p>16       European Union" ..... 99</p> <p>17 Exhibit 3   Backup for the ex post</p> <p>18       calculation ..... 104</p> <p>19 Exhibit 4   Backup for the ex ante</p> <p>20       calculation ..... 104</p> <p>21 Exhibit 5   PowerPoint presentation titled</p> <p>22       "Beyond Bernanke," dated</p> <p>23       August 17, 2015, Bates</p> <p>24       GOOG-DOJ-28385887 ..... 123</p> <p>25</p>

<p style="text-align: right;">Page 6</p> <p>1 (Exhibits continued)</p> <p>2 EXHIBIT DESCRIPTION PAGE</p> <p>3 Exhibit 6 PowerPoint presentation titled</p> <p>4 "Beyond Bernanke," dated</p> <p>5 October 21, 2013, Bates</p> <p>6 GOOG-DOJ-12700489 . . . . . 148</p> <p>7 Exhibit 7 Email about the launch of Global</p> <p>8 Bernanke, Bates GOOG-DOJ-</p> <p>9 15637938 . . . . . 152</p> <p>10 Exhibit 8 Four-page document describing</p> <p>11 Global Bernanke, Bates</p> <p>12 GOOG-DOJ-14161943 . . . . . 158</p> <p>13 Exhibit 9 Printout from the Internet</p> <p>14 Encyclopedia of Philosophy with</p> <p>15 definition of fallacies . . . . . 241</p> <p>16 Exhibit 10 Article by Reuters titled</p> <p>17 "Google Close to Clinching</p> <p>18 Groupon Deal . . . . . 263</p> <p>19 Exhibit 11 Reproduction of Figure 1 graph</p> <p>20 with added points . . . . . 293</p> <p>21 Exhibit 12 Another reproduction of the</p> <p>22 Figure 1 graph with added points</p> <p>23 and line . . . . . 295</p> <p>24</p> <p>25</p>	<p style="text-align: right;">Page 8</p> <p>1 MR. GARRETT: Tyler Garrett, Freshfields,</p> <p>2 for Google.</p> <p>3 MR. COLLIER: I guess continuing in person,</p> <p>4 in person is Marc Collier with Norton Rose</p> <p>5 Fulbright and Zeke DeRose with the Lanier Law</p> <p>6 Firm.</p> <p>7 THE VIDEOGRAPHER: Thank you. Will the</p> <p>8 court reporter please swear in the witness.</p> <p>9 * * * * *</p> <p>10 Whereupon,</p> <p>11 DAVID W. DERAMUS, Ph.D.,</p> <p>12 having been first duly sworn, testified</p> <p>13 upon his oath as follows:</p> <p>14 EXAMINATION BY COUNSEL FOR DEFENDANT GOOGLE</p> <p>15 BY MR. DAVIS:</p> <p>16 Q Good morning, Dr. DeRamus. What do you,</p> <p>17 what do you want me to call you?</p> <p>18 A You can call me Dr. DeRamus, since we're on</p> <p>19 the record.</p> <p>20 Q Will do, and are you all good to proceed</p> <p>21 with your deposition?</p> <p>22 A Yes, I am.</p> <p>23 Q In your work in this case, one of the things</p> <p>24 that you've done is to perform a number of</p> <p>25 calculations that, in your view, derive an optimal</p>
<p style="text-align: right;">Page 7</p> <p>1 -----</p> <p>2 PROCEEDINGS</p> <p>3 9:11 a.m.</p> <p>4 -----</p> <p>5 THE VIDEOGRAPHER: Good morning. We are</p> <p>6 going on the record at 9:11 a.m. on October 28,</p> <p>7 2024. Please note that the microphones are</p> <p>8 sensitive and may pick up whispering and private</p> <p>9 conversations.</p> <p>10 Please mute your phones at this time. Audio</p> <p>11 and video recording will continue to take place</p> <p>12 unless all parties agree to go off the record.</p> <p>13 This is media unit one of the deposition of</p> <p>14 Dr. David DeRamus in the matter of State of</p> <p>15 Texas, et al, versus Google, LLC, filed in the</p> <p>16 United States District Court for the Eastern</p> <p>17 District of Texas, case number 4:20-CV-00957.</p> <p>18 My name is Orson Braithwaite, representing</p> <p>19 Veritext Legal Solutions, and I'm the</p> <p>20 videographer. The court reporter is Laurie</p> <p>21 Donovan from the firm Veritext Legal Solutions.</p> <p>22 Counsel will now state that are experiences</p> <p>23 and affiliations for the record.</p> <p>24 MR. DAVIS: Michael Davis, Gibbs &amp; Bruns,</p> <p>25 for Google.</p>	<p style="text-align: right;">Page 9</p> <p>1 penalty for this case from the perspective of</p> <p>2 deterrence, right?</p> <p>3 A I would agree with everything you said,</p> <p>4 except perhaps "optimal." I provide a range of, of</p> <p>5 estimates of appropriate deterrent penalties, so I</p> <p>6 think it's -- ultimately it's my understanding that it</p> <p>7 is a jury decision as to what the optimal penalty</p> <p>8 should be, based on a broad range of considerations.</p> <p>9 Q Is the range that you provide in this case</p> <p>10 something other than optimal?</p> <p>11 A No. I would consider -- well, I think there</p> <p>12 are additional factors in the economics and finance</p> <p>13 literature that might point to factors that would</p> <p>14 increase the numbers. I would generally expect them,</p> <p>15 though, to be within the range that I provided.</p> <p>16 Q And there are also factors that you would</p> <p>17 expect the jury to use that could decrease the range</p> <p>18 below the numbers that you suggest, true?</p> <p>19 A Certainly. It's up to, up to the jury's</p> <p>20 discretion, yes.</p> <p>21 Q Okay, and to calculate that penalty range in</p> <p>22 this case, one of the things that you do is to use a</p> <p>23 formula that divides Google's expected benefit from</p> <p>24 the alleged unlawful conduct by the probability of</p> <p>25 detection and enforcement expressed as a decimal,</p>

<p style="text-align: right;">Page 10</p> <p>1 right?</p> <p>2 A In shorthand, yes.</p> <p>3 Q I'd like -- I will tell you I'm someone who</p> <p>4 always thinks that examples are helpful, because I</p> <p>5 can't keep some of the concepts in my head, so I'd</p> <p>6 like to talk through that formula using an example.</p> <p>7 (Exhibit 1 was marked for</p> <p>8 identification.)</p> <p>9 BY MR. DAVIS:</p> <p>10 Q This is Exhibit 1 that we just marked. I'll</p> <p>11 read it into the record, but if you want to read it</p> <p>12 for yourself, please don't hesitate.</p> <p>13 It says, "Consider, for example, an apple</p> <p>14 farmer who sells apples. While bringing 100 apples to</p> <p>15 a farmers' market to sell, two apples fall out of the</p> <p>16 farmer's cart and get bruised. The farmer then sells</p> <p>17 all 100 apples at the market, each for one dollar.</p> <p>18 The farmer knows that a bruised apple will sell for</p> <p>19 only 50 cents and that 50 percent of his customers</p> <p>20 check apples for bruises before buying them. The</p> <p>21 farmer sells all 100 apples without informing</p> <p>22 customers that some were bruised."</p> <p>23 "Assume that the law required the farmer,</p> <p>24 before selling the apples, to tell his customers that</p> <p>25 some apples may be bruised, and that any customer so</p>	<p style="text-align: right;">Page 12</p> <p>1 Q And so in this case, if we are wanting to</p> <p>2 deter unlawful conduct, what we want to do is</p> <p>3 incentivize that farmer, using a penalty, to make the</p> <p>4 disclosure required by law or just to not sell those</p> <p>5 apples, fair?</p> <p>6 MR. COLLIER: Objection; form.</p> <p>7 THE WITNESS: Either that or not to engage</p> <p>8 in the deceptive act. So I guess I'm -- not</p> <p>9 being an attorney, I see this from an economic</p> <p>10 perspective is you're trying to avoid deception,</p> <p>11 and in order to avoid deception, there is a law</p> <p>12 that requires disclosure; and absent a</p> <p>13 disclosure, then the party has engaged in</p> <p>14 deception. So what is the penalty required to</p> <p>15 prevent the deception?</p> <p>16 BY MR. DAVIS:</p> <p>17 Q And preventing the deception -- again, in</p> <p>18 this example with the farmer in Exhibit 1 -- means</p> <p>19 providing a disclosure that some apples may be</p> <p>20 bruised, right?</p> <p>21 A Or removing the two bruised apples and</p> <p>22 replacing them with non-bruised apples, so there's</p> <p>23 many ways in which the conduct could be -- the</p> <p>24 sanctioned conduct could be avoided in the first</p> <p>25 place.</p>
<p style="text-align: right;">Page 11</p> <p>1 informed would check an apple before purchasing it and</p> <p>2 discover if it was bruised."</p> <p>3 The first question is a hard one. Did I</p> <p>4 read Exhibit 1 correctly?</p> <p>5 A I believe you did, yes.</p> <p>6 Q And if we want to calculate a deterrent</p> <p>7 penalty using the formula you apply in this case, what</p> <p>8 we're doing is attempting to incentivize the farmer to</p> <p>9 provide the disclosure that the law requires, right?</p> <p>10 A Well, to provide the disclosure or not to</p> <p>11 engage in the actionable conduct, so not to -- not to</p> <p>12 engage in actionable conduct, so if there is a broader</p> <p>13 deception, then I guess there are different ways of</p> <p>14 looking at it; an obligation to make the disclosure or</p> <p>15 engaging in deception.</p> <p>16 Q So I want to make sure we're on the same</p> <p>17 page.</p> <p>18 In this example, if you look at the second</p> <p>19 paragraph of Exhibit 1, it says "assume that the law</p> <p>20 requires required the farmer, before selling the</p> <p>21 apples, to tell his customers that some apples may be</p> <p>22 bruised."</p> <p>23 Do you understand that that's what I'm</p> <p>24 asking to you assume the law to say?</p> <p>25 A I do, yes.</p>	<p style="text-align: right;">Page 13</p> <p>1 Q And again, I just want to make sure we're on</p> <p>2 the same page before we jump into the questions.</p> <p>3 In this example, selling bruised apples is</p> <p>4 legal. What's illegal is selling bruised apples</p> <p>5 without telling customers that they may be bruised.</p> <p>6 You with me?</p> <p>7 MR. COLLIER: Objection; form.</p> <p>8 THE WITNESS: I understand the way you're</p> <p>9 describing it is there is a broader range of</p> <p>10 deception, though, that occurs against all</p> <p>11 customers if the farmer is not disclosing the</p> <p>12 nature of the -- the fact that there are bruised</p> <p>13 apples.</p> <p>14 So it's not just that there are two bruised</p> <p>15 apples that the farmer is selling; it's that the</p> <p>16 farmer is failing to disclose to all customers</p> <p>17 coming up to his cart that he has two -- that in</p> <p>18 his basket of apples, there are two bruised</p> <p>19 apples.</p> <p>20 So a customer, any customer who comes up</p> <p>21 does not know whether -- or they all think,</p> <p>22 coming up to the apple cart to buy the apples,</p> <p>23 that they're all buying completely unbruised</p> <p>24 apples, because they know that there's a law in</p> <p>25 place where they have reason to expect there are</p>

<p style="text-align: right;">Page 14</p> <p>1 laws in place to protect the consumer.</p> <p>2 BY MR. DAVIS:</p> <p>3 Q Understood, and so what we want to do is</p> <p>4 incentivize this farmer to make that disclosure to</p> <p>5 each customer, not just to ones who he thinks may be</p> <p>6 buying bruised apples, right?</p> <p>7 MR. COLLIER: Objection; form.</p> <p>8 THE WITNESS: Well, again, I think you're</p> <p>9 going broader into what is the intent of the</p> <p>10 lawmaker -- or -- the lawmaker -- the legislature</p> <p>11 that established that law. I think the question</p> <p>12 is whether the law was intended to prevent</p> <p>13 deception or whether -- and so the, the</p> <p>14 disclosure is a, simply a means of, of preventing</p> <p>15 that deception. The required disclosure, I</p> <p>16 should have said.</p> <p>17 BY MR. DAVIS:</p> <p>18 Q If you were asked as an economist to</p> <p>19 calculate a penalty or range of penalties in</p> <p>20 connection with the violation of law here described in</p> <p>21 the example in Exhibit 1, the first step would be to</p> <p>22 determine the gain that the farmer expected to obtain</p> <p>23 from the unlawful act, true?</p> <p>24 A Well, there are two different ways I</p> <p>25 described in my reports, that one is the gain to the</p>	<p style="text-align: right;">Page 16</p> <p>1 report, different measures of Google's revenues,</p> <p>2 and I describe those revenues as likely being</p> <p>3 inflated even on a gross basis, the gross</p> <p>4 bookings revenue, for example, as being inflated</p> <p>5 as a result of the conduct at issue, so, and</p> <p>6 those being a proxy for the harm, but I don't</p> <p>7 come to a, a measure of the incremental societal</p> <p>8 harm the way I come to a measure of the</p> <p>9 incremental benefits to Google.</p> <p>10 BY MR. DAVIS:</p> <p>11 Q And so using the formula that you use in</p> <p>12 this case, which divides the wrongdoer's expected gain</p> <p>13 divided by the probability of detection and</p> <p>14 enforcement, how would you calculate the farmer's</p> <p>15 expected gain from the wrongdoing in the example in</p> <p>16 Deposition Exhibit 1?</p> <p>17 MR. COLLIER: Object to form.</p> <p>18 THE WITNESS: Well, I would say that the</p> <p>19 question -- it begs the question about whether</p> <p>20 anyone would have come up to the farmer's cart to</p> <p>21 begin with, in which case the benefits to the</p> <p>22 farmer would be his entire profits divided by the</p> <p>23 probability of, of that being detected, one can</p> <p>24 imagine that the probability of detection being</p> <p>25 relatively low, and so I would expect a fairly,</p>
<p style="text-align: right;">Page 15</p> <p>1 wrongdoer or the other is the societal harm. That</p> <p>2 would be one way would be to focus on the gain, yes.</p> <p>3 Q And in your report, you don't calculate</p> <p>4 societal harm, true?</p> <p>5 A I don't derive an explicit calculation of</p> <p>6 it. I do make an assessment of it, and there are</p> <p>7 certain figures in my report that I point to that, in</p> <p>8 my view, are indicative of the magnitude of societal</p> <p>9 harm, and I conclude that directionally the magnitude</p> <p>10 of harm -- I conclude that directionally, the</p> <p>11 magnitude of societal harm is greater than the</p> <p>12 benefits to Google.</p> <p>13 Q Is there a place in your report that I can</p> <p>14 look to for a numerical figure of the harm that you</p> <p>15 say was caused by the nondisclosure of Project</p> <p>16 Bernanke?</p> <p>17 A If you hand me my report, I can point you to</p> <p>18 the sections of my report where I discuss this.</p> <p>19 Q So I'm just asking whether you recall</p> <p>20 putting a numerical figure on the harm to society that</p> <p>21 you believe was caused by any of the alleged</p> <p>22 wrongdoing in this case.</p> <p>23 MR. COLLIER: I'm going to object to form.</p> <p>24 THE WITNESS: As I generally recall, I --</p> <p>25 referring to, I believe in section 4 of my</p>	<p style="text-align: right;">Page 17</p> <p>1 eventually, a fairly high multiple, especially on</p> <p>2 ex ante basis, I should say.</p> <p>3 BY MR. DAVIS:</p> <p>4 Q So I actually only want to talk about the</p> <p>5 numerator first, the expected gain to the farmer, and</p> <p>6 then we can talk about probability of detection</p> <p>7 second, because it's hard for me to keep straight at</p> <p>8 the same time.</p> <p>9 Can you put a dollar figure on the</p> <p>10 numerator, the farmer's expected benefit from failing</p> <p>11 to disclose to his customers that some apples may be</p> <p>12 bruised?</p> <p>13 A It doesn't say what the profit is per apple</p> <p>14 that he's selling, but again, if, if a deception is</p> <p>15 really viewed from the lens of all people who buy</p> <p>16 apples from his cart with the expectation that they</p> <p>17 are all good, there's no probability of, of getting a</p> <p>18 bad apple.</p> <p>19 So for a customer, there's a zero</p> <p>20 probability in expectation because of the law, that</p> <p>21 there are no bruised apples. So therefore, everyone</p> <p>22 who comes up is buying an apple based on that</p> <p>23 deception. So his deception has resulted in the</p> <p>24 totality of the profits that he earned on that</p> <p>25 particular day.</p>

<p style="text-align: right;">Page 18</p> <p>1 Q That would be the case if this example</p> <p>2 included an additional fact; namely, that nobody would</p> <p>3 buy apples if they thought it was a possibility that</p> <p>4 one was bruised, right?</p> <p>5 MR. COLLIER: Objection; form.</p> <p>6 THE WITNESS: I think it would also depend</p> <p>7 on the alternatives that other people had at the</p> <p>8 time, is there another cart right next door, and</p> <p>9 whether that other cart complied fully with the</p> <p>10 law, and if people knew, hey, there's some</p> <p>11 probability you're going to get some bruised</p> <p>12 apples from this farmer, and there is zero</p> <p>13 probability that you will get bruised apples from</p> <p>14 the next farmer, then I would expect all 100 --</p> <p>15 if there was only a total demand for 100 apples,</p> <p>16 that the other farmer's cart would be sold out</p> <p>17 and this farmer would not sell any.</p> <p>18 BY MR. DAVIS:</p> <p>19 Q Are you taking into account the fact that</p> <p>20 the example in Deposition Exhibit 1 says explicitly</p> <p>21 that a bruised apple will still sell, but for 50 cents</p> <p>22 rather than one dollar?</p> <p>23 A Yes.</p> <p>24 Q All of your answers thus far have taken that</p> <p>25 fact into account?</p>	<p style="text-align: right;">Page 20</p> <p>1 society and the gain to Google, and I think it's</p> <p>2 important to consider both factors, but I do calculate</p> <p>3 the gain to Google as part of my derivation of the</p> <p>4 deterrent penalty range in this case.</p> <p>5 Q Okay. So we've agreed that the world with</p> <p>6 no disclosure and no bruised apples, the farmer has</p> <p>7 \$100.</p> <p>8 What about in the world with disclosure; how</p> <p>9 many dollars would the farmer have?</p> <p>10 A Well, it would depend --</p> <p>11 MR. COLLIER: Objection; form. Go ahead.</p> <p>12 THE WITNESS: It would depend on the way</p> <p>13 that particular disclosure was made. If the</p> <p>14 disclosure was this farmer in a cart next to</p> <p>15 another farmer, and the farmer said I have</p> <p>16 randomly two apples within my cart that are</p> <p>17 bruised. I'm not going to tell you which one,</p> <p>18 then I would expect the competitive equilibrium,</p> <p>19 would be if there's a total demand in the market</p> <p>20 for 100 apples, I would expect that the cart next</p> <p>21 door would entirely sell out and this farmer</p> <p>22 would not sell any, and therefore, in that</p> <p>23 but-for world, the farmer would have zero</p> <p>24 profits.</p> <p>25 I think there's a different way in which, if</p>
<p style="text-align: right;">Page 19</p> <p>1 MR. COLLIER: Objection; form.</p> <p>2 THE WITNESS: Yes.</p> <p>3 MR. COLLIER: Hold on. Dr. DeRamus, we</p> <p>4 talked over each other. I'll just remind you:</p> <p>5 Give me just a beat to make an objection before</p> <p>6 you answer.</p> <p>7 THE WITNESS: Understood.</p> <p>8 BY MR. DAVIS:</p> <p>9 Q In a world with no bruised apples and no</p> <p>10 disclosure, this farmer would make \$100 in revenue,</p> <p>11 right?</p> <p>12 A Correct. Well, I'm sorry. Will make \$100</p> <p>13 in revenue? Yes.</p> <p>14 Q And I think you, you were about to answer my</p> <p>15 next question, which is when we're talking about</p> <p>16 calculating a penalty using expected gain divided by</p> <p>17 the probability of detection, we would need to figure</p> <p>18 out the farmer's expected profit per apple, not just</p> <p>19 his revenue, right?</p> <p>20 A That's correct. If we're, if we're using</p> <p>21 the gain as the measure of the deterrent penalty as</p> <p>22 opposed to societal harm.</p> <p>23 Q Right, like you do in your report, right?</p> <p>24 A Well, as I -- again, I'll refer you back to</p> <p>25 my previous answer. I consider both the harm to</p>	<p style="text-align: right;">Page 21</p> <p>1 the farmer were to say here is all 98, put all 98</p> <p>2 apples that were not bruised in -- I'm sorry --</p> <p>3 how many bruised apples does he have? He's got</p> <p>4 two apples, right.</p> <p>5 So all 98 unbruised apples, he put those --</p> <p>6 he puts those in one stack. He segregates the</p> <p>7 other two bruised apples -- sorry. He separates</p> <p>8 the two, the two bruised apples in a separate</p> <p>9 pile, and then he puts a sign that says 50 cents</p> <p>10 on those apples. If that's your but-for world,</p> <p>11 then he makes \$99.</p> <p>12 BY MR. DAVIS:</p> <p>13 Q If a farmer sells 100 apples, two of which</p> <p>14 are bruised, and tells each customer that an apple may</p> <p>15 be bruised, and as it says in Exhibit 1, a customer so</p> <p>16 informed will check an apple for bruising before</p> <p>17 purchasing it and discover the bruise if they get that</p> <p>18 disclosure, isn't it true that this farmer should</p> <p>19 expect \$99 in revenue?</p> <p>20 A I would say again it depends on the broader</p> <p>21 competitive constraints, so if you're saying this is</p> <p>22 the only apple in the market -- sorry. This is the</p> <p>23 only -- this is a monopoly apple cart, and you have a</p> <p>24 lot of very hungry people, then yes, your results</p> <p>25 would obtain.</p>



<p style="text-align: right;">Page 22</p> <p>1 I would say if there are all competitive</p> <p>2 alternatives, however, that it is much easier for</p> <p>3 others to simply go to the cart next door where there</p> <p>4 are no bruised apples. So again, it depends, and then</p> <p>5 in which case the farmer would still go home with</p> <p>6 nothing.</p> <p>7 Q I'm not familiar with the phrase "your</p> <p>8 results would obtain." Are you saying that if there's</p> <p>9 only one apple cart available, that yes, this farmer</p> <p>10 would expect \$99 in revenue if he made the disclosures</p> <p>11 required by law?</p> <p>12 MR. COLLIER: Objection; form.</p> <p>13 THE WITNESS: Yes, and if customers were so</p> <p>14 inclined to undertake -- A, if he were the only</p> <p>15 apple cart in the market, and B, if customers</p> <p>16 were so inclined to do their own checking, and</p> <p>17 were sufficiently hungry that they wanted to buy</p> <p>18 those apples from him.</p> <p>19 BY MR. DAVIS:</p> <p>20 Q Have you ever heard the phrase "fighting the</p> <p>21 hypothetical"?</p> <p>22 A No, but that's an interesting concept, yes.</p> <p>23 Thank you.</p> <p>24 Q You're smiling. How come?</p> <p>25 A Because I was assuming you were raising</p>	<p style="text-align: right;">Page 24</p> <p>1 required by law, customers don't know. All customers</p> <p>2 buy the 100 apples and pay one dollar for them, so he</p> <p>3 makes \$100.</p> <p>4 Q Doesn't the example in front of you,</p> <p>5 Deposition Exhibit 1, say that 50 percent of his</p> <p>6 customers check apples for bruises before buying them?</p> <p>7 A Oh, indeed. Thank you.</p> <p>8 So probabilistically, that would be correct,</p> <p>9 if again assuming -- not to fight your hypothetical,</p> <p>10 but assuming a certain sequence of events in terms of</p> <p>11 what happens when that first customer finds that</p> <p>12 apple, so the customer finds an apple, thinks they're</p> <p>13 all -- finds the bruised apple and says -- tells</p> <p>14 everybody else that, hey, these are a bunch of</p> <p>15 bruised -- there are bruised apples in this, I would</p> <p>16 expect everybody to go away and buy from the</p> <p>17 competitor's cart.</p> <p>18 Q You know that in the question I just asked</p> <p>19 you, I asked you to assume there was one apple cart,</p> <p>20 right?</p> <p>21 MR. COLLIER: Objection; form.</p> <p>22 THE WITNESS: Well, if you would like me to</p> <p>23 assume that, if you would like me to assume</p> <p>24 there's only one apple cart in the market, that</p> <p>25 this is a, this is a monopoly apple seller, I'm</p>
<p style="text-align: right;">Page 23</p> <p>1 that, that I am just your -- I took it as your</p> <p>2 implication that I was fighting the hypothetical.</p> <p>3 Q And in fairness, you are a little bit,</p> <p>4 right?</p> <p>5 MR. COLLIER: Objection; form.</p> <p>6 THE WITNESS: In fairness, no. I think</p> <p>7 there are serious issues in this case, and I</p> <p>8 think there are significant issues in this case</p> <p>9 related to the deceptive conduct at issue, and I</p> <p>10 don't think your hypothetical is apposite to the</p> <p>11 issues in this case.</p> <p>12 And so in drawing a particular conclusion</p> <p>13 and applying economic principles, you do need to</p> <p>14 understand the specifics of this case and not</p> <p>15 simply rely on really broad hypotheticals.</p> <p>16 BY MR. DAVIS:</p> <p>17 Q Assuming one apple cart in the farmers'</p> <p>18 market, this farmer would expect \$99.50 in revenue if</p> <p>19 he did not make the disclosures required by law, true?</p> <p>20 A I'm sorry. Say that one more time.</p> <p>21 Q Assuming one apple cart in the farmers'</p> <p>22 market, this farmer would expect \$99.50 in revenue if</p> <p>23 he did not make the disclosures required by law, true?</p> <p>24 A I think you're saying he would have made</p> <p>25 \$100 if he sells -- if he doesn't make the disclosures</p>	<p style="text-align: right;">Page 25</p> <p>1 happy to assume that for the purposes of this</p> <p>2 hypothetical.</p> <p>3 BY MR. DAVIS:</p> <p>4 Q Are the penalties that you calculate in --</p> <p>5 excuse me -- the range of penalties that you calculate</p> <p>6 in your report in this case intended to address the</p> <p>7 alleged antitrust conduct in this case, in addition to</p> <p>8 the alleged violations of deceptive trade practice</p> <p>9 statutes?</p> <p>10 A I believe I have a sentence in my report</p> <p>11 that goes to that issue. I'm happy to read that to</p> <p>12 you if you would like.</p> <p>13 Q I'm actually just asking what your take is.</p> <p>14 Do you think that the penalties that you have</p> <p>15 calculated in this case as a potential range are</p> <p>16 intended to address only the violations alleged of</p> <p>17 deceptive trade practice statutes or are they also</p> <p>18 intended to address violations of antitrust law?</p> <p>19 A Well, again, this is one of those issues,</p> <p>20 because it does go to the broader claims, I would be</p> <p>21 much more comfortable in giving you a complete and</p> <p>22 accurate answer to that if I have my report. I can</p> <p>23 tell you in general terms, but I'm concerned that,</p> <p>24 because it does go to the issue of one of the</p> <p>25 underlying claims, that I would be much more</p>



<p style="text-align: right;">Page 26</p> <p>1 comfortable assuring that my, my answer is complete</p> <p>2 and accurate if I had my report in front of me.</p> <p>3 Q Without looking at your report, are you able</p> <p>4 to tell me what violations of law you're meaning to</p> <p>5 calculate penalties for?</p> <p>6 A The penalties are calculated under, my</p> <p>7 understanding, the provisions of the various Deceptive</p> <p>8 Trade Practices Act. That's the -- I generally refer</p> <p>9 to the Texas DTPA Act or DTPA, but also under similar</p> <p>10 state statutes as well.</p> <p>11 I believe in my report I do reference the</p> <p>12 antitrust claims. I'm aware of the antitrust claims</p> <p>13 are there, but they are not -- my opinions are not</p> <p>14 dependent on a finding of liability on the antitrust</p> <p>15 issues.</p> <p>16 In my mind, there are certain issues related</p> <p>17 to the conduct that, as an economist, I can't ignore</p> <p>18 or that they do factor into my consideration, they do</p> <p>19 factor into my opinions.</p> <p>20 Q Am I understanding correctly that there are</p> <p>21 antitrust considerations that factor into the range of</p> <p>22 penalties that you calculate in this case?</p> <p>23 A Not explicitly, no.</p> <p>24 Q What about implicitly?</p> <p>25 A Well, there are ways in which I consider the</p>	<p style="text-align: right;">Page 28</p> <p>1 Q Do you remember what my question was?</p> <p>2 A I do.</p> <p>3 Q What was it?</p> <p>4 A It was to what extent is the antitrust, the</p> <p>5 antitrust claims incorporated into my estimates of the</p> <p>6 penalties, or at least that's -- I'm paraphrasing.</p> <p>7 That was my understanding.</p> <p>8 Q And the answer is not at all, right?</p> <p>9 MR. COLLIER: Objection; form, asked and</p> <p>10 answered.</p> <p>11 THE WITNESS: I've been asked to give my</p> <p>12 opinions in this matter about what is the</p> <p>13 appropriate deterrent and penalty amounts, and it</p> <p>14 does factor into those broader opinions, in terms</p> <p>15 of what is a reasonable deterrent penalty amount.</p> <p>16 It is not factored -- the antitrust claims</p> <p>17 in the antitrust conduct specifically considered</p> <p>18 in isolation from the, the deceptive conduct at</p> <p>19 issue is not something I have explicitly</p> <p>20 calculated. I have not explicitly calculated</p> <p>21 those benefits and added them to my estimates in</p> <p>22 terms of the specific numbers that are put forth</p> <p>23 in my report.</p> <p>24 BY MR. DAVIS:</p> <p>25 Q Does the allegation that Google possessed</p>
<p style="text-align: right;">Page 27</p> <p>1 conduct to have -- or based on my review of the expert</p> <p>2 reports submitted by others who were opining on the</p> <p>3 antitrust issues, such as Dr. Gans, that the conduct</p> <p>4 at issue contributed to Google's ability to maintain,</p> <p>5 to establish and maintain a monopoly position, that</p> <p>6 the market structure is changed as a result of its</p> <p>7 conduct over the entirety of the time period, and by</p> <p>8 "its conduct," I mean the totality of the conduct, not</p> <p>9 simply the deceptive conduct that I'm particularly</p> <p>10 analyzing.</p> <p>11 As such, I expect a gain to Google from its</p> <p>12 conduct to be larger than what I have estimated, as my</p> <p>13 estimates are derived based on Google's own studies of</p> <p>14 the gains from implementing certain programs that</p> <p>15 are -- have been alleged to be deceptive, and does not</p> <p>16 sweep in the -- I don't attempt to calculate the</p> <p>17 additional gains that Google would have been able to</p> <p>18 make as a result of its reinforcement of its market</p> <p>19 power in the market, or those longer term, so those</p> <p>20 longer term benefits.</p> <p>21 So in that regard, it informs my opinion,</p> <p>22 that conduct informs my opinion, but it does not --</p> <p>23 but the calculations themselves that I'm offering do</p> <p>24 not depend on a finding of liability on the antitrust</p> <p>25 claims.</p>	<p style="text-align: right;">Page 29</p> <p>1 monopoly power in one or more markets affect the</p> <p>2 penalties that you calculate in this case?</p> <p>3 A No, they do not -- they do not affect the</p> <p>4 calculations that I have made. I have not made an</p> <p>5 adjustment factor to those to account for that factor,</p> <p>6 for example.</p> <p>7 Q Okay.</p> <p>8 In determining the numerator of the formula</p> <p>9 you use in this case, namely, the wrongdoer's expected</p> <p>10 gain divided by the probability of detection and</p> <p>11 enforcement, are we comparing a world with the</p> <p>12 wrongdoing to a but-for world without the wrongdoing?</p> <p>13 A Effectively, yes. It's the, it's the world</p> <p>14 with the, with the conduct and without the conduct,</p> <p>15 correct? Well, but -- I'm sorry. Let me, let me</p> <p>16 think for a minute. It's a -- I think this notion of</p> <p>17 a but-for world is -- I have a description in my</p> <p>18 report about -- a section in my report where I discuss</p> <p>19 the different lens that might be applied here versus</p> <p>20 in a standard damages type case, where that but-for</p> <p>21 analysis is much more front and center.</p> <p>22 But ultimately my calculations are all based</p> <p>23 on the incremental benefits to Google of the -- of</p> <p>24 three particular bidding strategies. I'm sorry.</p> <p>25 Three particular modifications to its auction program,</p>

<p style="text-align: right;">Page 30</p> <p>1 Bernanke, RPO and DRS.</p> <p>2 I should also mention in all these answers,</p> <p>3 I'm referring to the calculation in section 6 of my</p> <p>4 report. In section 7 of my report, I have an entirely</p> <p>5 different approach.</p> <p>6 Q I'm, I'm tracking that. When I have said --</p> <p>7 and I don't mean to interrupt you. I just --</p> <p>8 MR. COLLIER: I'm going to object. You</p> <p>9 interrupted. I'd like him to finish his sentence</p> <p>10 even if you're tracking.</p> <p>11 Go ahead, Dr. DeRamus.</p> <p>12 THE WITNESS: I have two separate</p> <p>13 methodological approaches to estimating deterrent</p> <p>14 penalties, one in section 6 and one in section 7.</p> <p>15 My answers up to this point have been</p> <p>16 largely directed at those calculations in section</p> <p>17 6, as I was assuming that was where you were</p> <p>18 focused, but to be clear, my opinions do</p> <p>19 encompass the ranges that I derive also in</p> <p>20 section 7.</p> <p>21 BY MR. DAVIS:</p> <p>22 Q And just object to everything about section</p> <p>23 7 as nonresponsive.</p> <p>24 To be clear for the record, when I've been</p> <p>25 asking about the formula, the wrongdoer's expected</p>	<p style="text-align: right;">Page 32</p> <p>1 probability?</p> <p>2 A I would say it's more the actual</p> <p>3 probability. I think there's a -- I'm not trying to</p> <p>4 be a mind reader for what Google employees may have</p> <p>5 had in their heads in terms of what their</p> <p>6 probabilities were, but -- and it is data that I'm</p> <p>7 drawing from research, other empirical studies that</p> <p>8 have been done.</p> <p>9 So it is more of an actual probability, but</p> <p>10 again with some range, because -- or I should say it</p> <p>11 is estimated as a range, because there is some degree</p> <p>12 of uncertainty associated with the probability of</p> <p>13 detection, enforcement and collection of a penalty</p> <p>14 associated with the specific type of conduct at issue</p> <p>15 here.</p> <p>16 Q Does the economic literature and research on</p> <p>17 which you rely with respect to the probability of</p> <p>18 detection and enforcement state that the probability</p> <p>19 should be determined subjectively to the specific</p> <p>20 wrongdoer or objectively?</p> <p>21 A I think one could read the literature to</p> <p>22 suggest either perspective. I think generally it</p> <p>23 would be objectively, because there are -- that --</p> <p>24 the -- that literature is within a, probably a broader</p> <p>25 public policy framework, to try and determine what is</p>
<p style="text-align: right;">Page 31</p> <p>1 gain divided by probability of detection and</p> <p>2 enforcement, that's section 6 of your report, right?</p> <p>3 A That's where I did the calculations, yes,</p> <p>4 but I -- maybe just for completeness, I would say --</p> <p>5 I'd back up to section 2 through 6, because section 2</p> <p>6 is where I lay out the economic principles of it, and</p> <p>7 I even in section -- I'm sorry. Section 3 and 4</p> <p>8 are -- and 5 are all relevant to the buildup for the</p> <p>9 calculations that are in section 6.</p> <p>10 Q I should have asked a better question, which</p> <p>11 is that what we've been talking about so far, the</p> <p>12 formula, expected gain to the wrongdoer divided by</p> <p>13 probability of detection and enforcement, has nothing</p> <p>14 to do with section 7 of your report, correct?</p> <p>15 MR. COLLIER: Objection; form.</p> <p>16 THE WITNESS: The calculations don't go into</p> <p>17 section 7. They inform my opinion as to the</p> <p>18 reasonableness of the results in section 7, but</p> <p>19 they do not feed into that, if that's how I</p> <p>20 understand you to be asking the question.</p> <p>21 BY MR. DAVIS:</p> <p>22 Q Moving to the denominator, the probability</p> <p>23 of detection and enforcement, as an economist, do you</p> <p>24 estimate the actual probability of detection and</p> <p>25 enforcement or the wrongdoer's expected or believed</p>	<p style="text-align: right;">Page 33</p> <p>1 an optimal penalty framework to apply and how to deter</p> <p>2 conduct, not just by one individual but by others</p> <p>3 similarly situated.</p> <p>4 So because the whole point of having</p> <p>5 deterrence is not simply to deter that particular</p> <p>6 individual, but to incentivize compliance with the law</p> <p>7 by others as well. So to do that, I think you have to</p> <p>8 have some notion of objective probability of</p> <p>9 detection, enforcement and collection of a penalty as</p> <p>10 opposed to something where it might vary so</p> <p>11 substantially person by person.</p> <p>12 Q And just to make sure that I'm understanding</p> <p>13 correctly, is it, is it your understanding that the</p> <p>14 answer you just gave is consistent with the economic</p> <p>15 literature you cite in your report on the</p> <p>16 determination of optimal deterrent penalties?</p> <p>17 A I would say broadly, I know that there are</p> <p>18 very specific factors. I would say wrongdoer-specific</p> <p>19 factors that that literature does cite, without having</p> <p>20 it all in front of me to refer to, it's a little hard</p> <p>21 to remember which author says what about a particular</p> <p>22 factor, but the -- you know, for example, there are</p> <p>23 references to risk preferences. I think I cite to a</p> <p>24 lot of that in my report, and a, a risk-averse</p> <p>25 individual.</p>

<p style="text-align: right;">Page 34</p> <p>1 So, for example, someone who had less 2 income, you might need less of a deterrent penalty 3 amount to deter that particular violation, because the 4 consequence to them would be more severe rather than a 5 very wealthy person. 6 So I guess the question is really whether 7 it's an assessment of individual characteristics of, 8 you know, risk tolerance or risk preference or 9 financial abilities versus that probability of 10 detection and enforcement. That's the part that I 11 think is -- I would have to think further about 12 whether there was any discussion of that as being a 13 variable that would effectively be different for each 14 individual. I just have a hard time thinking how you 15 would implement that as a practical matter. 16 Q So assuming we have time, we're going to get 17 into some of the literature that you cite in your 18 report. Globally, generally speaking, are you 19 intending to apply a methodology that you find in the 20 existing economic literature or one that you have come 21 up with for this case? 22 A I'm applying a method that I consider to be 23 very well-grounded in the economic and finance 24 literature, yes. There are -- yes, I would say 25 everything that I'm doing is applying well-established</p>	<p style="text-align: right;">Page 36</p> <p>1 In terms of the theoretical literature, I 2 would still say it's the kind of broader framework. 3 There's no -- I don't see the economic literature as 4 being, I guess, a cookbook, the way you might find in 5 a manual for how to prepare generally accepted 6 accounting principle-based financial statements. It's 7 not a cookbook approach. It's a principle issue. 8 Q Would you say it's less of a cookbook 9 approach as compared to the existing economic 10 literature on calculating ordinary compensatory 11 damages? 12 MR. COLLIER: Objection; form. 13 THE WITNESS: Well, again, this is where I 14 would refer you to my report in a very -- I 15 believe section 2, where I describe the various 16 different methods for determining monetary 17 penalties under different causes of action. 18 So I would agree that the -- deriving a 19 deterrent penalty amount does involve applying 20 different principles than standard -- what I 21 would typically apply in deriving compensatory 22 damages, in a different type of case with a 23 different cause of action. 24 BY MR. DAVIS: 25 Q Is there more room for disagreement between</p>
<p style="text-align: right;">Page 35</p> <p>1 methods in economics and finance to the facts of this 2 case. 3 Q Including your methodology for estimating 4 the wrongdoer's expected gain from the unlawful 5 conduct, right? 6 A Correct. 7 Q And including your methodology for 8 estimating the relevant probability of detection and 9 enforcement, right? 10 A That's correct. 11 Q And so when we look at those sources, your 12 methodology should be consistent with them, broadly 13 speaking, fair? 14 A Well, my methodology should be consistent in 15 terms of -- when I say "my methodology," my 16 methodology is to identify sources of information that 17 give me information about the probability of 18 detection, enforcement and collection of penalties. 19 So there are times when I need to collect 20 all that information and make a judgment as to what 21 sources are more applicable to the facts of this case 22 than others, but if there are other sources on that 23 that provide different numbers, then I would take 24 those into consideration. I think that's where you 25 were going.</p>	<p style="text-align: right;">Page 37</p> <p>1 two good faith economists when it comes to calculating 2 what they believe to be optimal civil penalties as 3 compared to compensatory damages? 4 A I would say there is always room for good 5 faith disagreements between economists about, just 6 about any topic. I think different economists bring 7 to the table different experience and a different 8 theoretical lens. 9 I would say I have seen many excellent 10 economists have very different opinions as to damages 11 calculations in other contexts, in issues that were 12 more compensatory in nature across the board, I would 13 say. 14 So I wouldn't say there's a broader or 15 lesser degree of room for disagreements here than in 16 other types of cases. 17 I think the fact that the application of 18 deterrent penalty concepts here are such that you will 19 likely get a broader range, and I have a fairly broad 20 range in my report that's derived by the use of these 21 different probabilities of detection, enforcement and 22 collection. 23 So there's some degree to which that range 24 will be bigger, because there are effectively 25 multipliers applied here that might not apply in other</p>

<p style="text-align: right;">Page 38</p> <p>1 cases, but other cases, like antitrust cases where  2 there's automatic trebling, will provide similar room  3 for disagreements between economists.  4 Q Turning back to our example in Exhibit 1  5 with the farmer, to determine the numerator in the  6 equation used in section 6 of your report, do we  7 compare the money in the farmer's pocket in the world  8 without the disclosure required by law to the money in  9 the farmer's pocket in the world, assuming he had made  10 the disclosure required by law?  11 MR. COLLIER: Objection; form.  12 THE WITNESS: In the -- not to beat a dead  13 horse on that example on a hypothetical, but I  14 would say -- I think I described it before, as my  15 perspective, was the, the issue is what is the  16 gain to the farmer from that -- the farmer  17 obtained from engaging in the deception, and in  18 that, in that -- from that perspective, the  19 entirety of the profits that he had in his, in  20 his pocket were the appropriate measure of the  21 numerator to use in that calculation.  22 BY MR. DAVIS:  23 Q The issue is the, the gain that the farmer,  24 as with any wrongdoer, obtained from violating the  25 law, right?</p>	<p style="text-align: right;">Page 40</p> <p>1 world in which the wrongdoer did make the disclosure  2 to a world in which the wrongdoer did not, true?  3 MR. COLLIER: Objection; form.  4 THE WITNESS: Well, I think it would depend  5 if disclosure is fundamentally intertwined with  6 the particular conduct at issue. If the conduct  7 had even occurred absent disclosure, would -- I'm  8 sorry. Would the conduct have even occurred with  9 the disclosure is one issue, and so to that  10 extent, there are certain types of conduct where  11 the failure to disclose is part and parcel of the  12 conduct itself. It's not like it's simply a  13 by-product of the conduct, or it's not something  14 off to the side.  15 BY MR. DAVIS:  16 Q Which would thus affect the money in the  17 wrongdoer's pocket in the world in which the  18 disclosure was made, right?  19 MR. COLLIER: Objection; form.  20 (Discussion was held off the record.)  21 THE VIDEOGRAPHER: We're going off the  22 record at 9:54 a.m.  23 (Whereupon, a short recess was taken.)  24 THE VIDEOGRAPHER: The time is 9:56 a.m.  25 We're on the record.</p>
<p style="text-align: right;">Page 39</p> <p>1 A Correct, and I'm assuming that the law is  2 one that prevents a deceptive trade practice, as  3 described in your hypothetical.  4 Q Where does that hypothetical say that?  5 A Because it is -- well, I infer that because  6 you are talking about the requirement of disclosure of  7 information, and the failure to disclose would  8 therefore be deception as I understood it.  9 Q So assuming that the only violation of law  10 is a failure to disclose, when we are calculating the  11 expected gain to the wrongdoer, we compare a world in  12 which the wrongdoer had made the disclosure to the  13 world in which he did not, true?  14 MR. COLLIER: Objection; form.  15 THE WITNESS: Well, is that true? I can  16 accept that as the hypothetical, and that was the  17 hypothetical I was using in our prior -- in my  18 prior answer. So I just didn't want to have to  19 kind of re-go over those same answers with you.  20 BY MR. DAVIS:  21 Q Stepping away from Exhibit 1 and talking  22 about general principles, if the only violation of law  23 at issue is a failure to make a required disclosure,  24 and we are calculating the expected gain to the  25 wrongdoer from the violation of law, we compare a</p>	<p style="text-align: right;">Page 41</p> <p>1 BY MR. DAVIS:  2 Q So, Dr. DeRamus, if -- in a circumstance  3 where the only violation of law is a failure to make a  4 required disclosure, to determine the gain that the  5 wrongdoer expected to obtain from its unlawful  6 conduct, we compare a world in which the disclosure  7 was made to a world in which it was not made; isn't  8 that true?  9 A Well, it just -- it depends on what that  10 but-for world would have actually looked like with the  11 disclosure. There are certain types of conduct where  12 the conduct, the broader conduct never happens with  13 the disclosure.  14 So it is a difficult thing to parse that  15 out, and that's one of the reasons -- and maybe to  16 make your life a little bit easier, I could even point  17 you to a portion of my report where I describe why, in  18 certain circumstances, a, an incremental but-for  19 analysis might not be appropriate in certain cases.  20 I have an example of a mortgage lender who  21 doesn't do required underwriting, for example, and  22 there -- so I think that's probably very similar to  23 your hypothetical here, and where the enforcement and  24 enforcement agency might be concerned about the total  25 volume of loans issued by a mortgage underwriter that</p>

<p style="text-align: right;">Page 42</p> <p>1 didn't engage in any of the required underwriting, and  2 not simply on the incremental mortgages that the  3 company would have -- or that the incremental  4 mortgages that the underwriter wrote, that it wouldn't  5 have written in the but-for world, and I have some  6 other -- again, I'm happy to go through that example  7 in my report, but I think that is ultimately where  8 there's a disagreement between you and me about how we  9 see the appropriate calculation of the incremental  10 benefits to be used in this calculation.  11 Q I'm going to object to the entire answer as  12 nonresponsive, and just note for the record that the  13 answer was just shy of two minutes long. I'm not --  14 MR. COLLIER: I'll object to your commentary  15 after the word "nonresponsive."  16 BY MR. DAVIS:  17 Q I'm not meaning to try to trick you into  18 suggesting that the two worlds would be similar or  19 materially different. I'm not meaning to try to get  20 you to admit that in a world with the disclosure, the  21 conduct would still have happened.  22 The only question I have is: In a world in  23 which the only violation of law is a failure to  24 disclose, isn't it true that when we calculate the  25 expected gain to the wrongdoer, what we do is compare</p>	<p style="text-align: right;">Page 44</p> <p>1 THE WITNESS: Well, I guess this is where we  2 keep going around and around is it -- does the  3 deception -- in my view, it is the world with and  4 without the deception.  5 I think there are -- as an economist, when I  6 think about marginal impacts, there's lots of  7 ways of calculating that margin. So in this  8 particular context in your specific example, I  9 think the way I have done it in this case and the  10 methodological approach I've taken is the right  11 way to do it.  12 And in that case, I don't think the  13 appropriate way would be to simply say assume  14 that everything would have remained the same,  15 that the conduct -- that the deceptive conduct at  16 issue would have remained the same; i.e., in my  17 example of the mortgage lender, the mortgage  18 lender would not have been there in the market  19 doing the specific conduct if they had actually  20 done the underwriting, because they didn't have  21 the capabilities of actually doing the  22 underwriting.  23 BY MR. DAVIS:  24 Q And Dr. DeRamus, again, I'm not trying to  25 get you to admit that the world would be largely</p>
<p style="text-align: right;">Page 43</p> <p>1 the world with the disclosure to the world without the  2 disclosure?  3 A Not necessarily, for all the reasons I said  4 before.  5 Q The reasons that you said before included  6 things like, well, maybe the conduct doesn't happen at  7 all if you have to make a disclosure, right?  8 A Well, I said that there are certain times in  9 which the disclosure or the failure to disclose is  10 intimately related with the specific conduct, and in  11 that instance in particular, you would want to look at  12 the total gain that the individual obtained as a  13 result of the failure to disclose.  14 THE REPORTER: Did you say "would" or  15 "wouldn't"? Wouldn't want to look or would want  16 to look?  17 THE WITNESS: Would want to look at the  18 total gain.  19 BY MR. DAVIS:  20 Q I think we are saying the same thing.  21 By definition, the gain from a failure to  22 disclose is the difference between the actual world  23 without the disclosure and a but-for world with the  24 disclosure; isn't that true?  25 MR. COLLIER: Objection; form.</p>	<p style="text-align: right;">Page 45</p> <p>1 similar with or without a disclosure. What I am just  2 asking for is a definition of the term "gain from  3 nondisclosure."  4 So in a world where the only violation of  5 law is a failure to disclose, isn't it true that the  6 expected gain from the failure to disclose is the  7 expected difference between a world with the  8 disclosure and a world without it, including all of  9 the ramifications of making the disclosure?  10 MR. COLLIER: I'm going to object to form,  11 and counsel, you're getting harassing. This is  12 about the fifth time you've asked the same  13 question.  14 MR. DAVIS: I haven't gotten an answer yet.  15 MR. COLLIER: No, you don't like his answer.  16 With that said, Dr. DeRamus, you can answer  17 this again.  18 THE WITNESS: I think you're asking me to go  19 beyond the testimony -- the opinions I've offered  20 in the report. I think I provided a fairly clear  21 explanation of how I derive the numbers in my  22 report, and I think that is the appropriate way  23 to do the calculations in this particular case.  24 BY MR. DAVIS:  25 Q So I'm going to ask a different question.</p>



<p style="text-align: right;">Page 46</p> <p>1 Am I understanding correctly that the</p> <p>2 calculations in your report assume that there is a</p> <p>3 difference between the gain from a failure to disclose</p> <p>4 on the one hand, and on the other hand, the difference</p> <p>5 between a world with the disclosure and a world</p> <p>6 without it?</p> <p>7 A My calculations, as I describe in my report,</p> <p>8 estimate the -- and again, this is all about section</p> <p>9 6. We haven't touched section 7. In section 6 of my</p> <p>10 report, those calculations are all about the gain to</p> <p>11 Google, the expected gain and the actual gain in some</p> <p>12 instances, depending on the scenario, of the deceptive</p> <p>13 conduct that I understand to be at issue in this case.</p> <p>14 I have not tried to parse that out any</p> <p>15 further. That's what I describe in my report.</p> <p>16 Q And in your report, specifically in section</p> <p>17 6, you have assumed the deceptive conduct to be each</p> <p>18 of Bernanke, RPO and DRS, right?</p> <p>19 A Those are the conducts that I use in</p> <p>20 deriving the penalty amounts in that section, but I do</p> <p>21 provide a broader discussion of the deceptive conduct</p> <p>22 or allegedly deceptive conduct more broadly.</p> <p>23 Q And specifically you have assumed that those</p> <p>24 programs, in their entirety, are deceptive, right?</p> <p>25 A I assume if the jury finds that the -- those</p>	<p style="text-align: right;">Page 48</p> <p>1 amount.</p> <p>2 BY MR. DAVIS:</p> <p>3 Q If a jury were to determine that the only</p> <p>4 DTPA violation in connection with Bernanke was a</p> <p>5 failure to disclose it, you have not calculated the</p> <p>6 gain that Google expected to obtain from failing to</p> <p>7 disclose Bernanke, true?</p> <p>8 A Well, I think it would depend on what</p> <p>9 further conclusion the jury were to draw from that,</p> <p>10 from that finding, i.e., would Google have engaged</p> <p>11 in -- if that's the lens that they were to use, would</p> <p>12 Google have engaged in the conduct with full</p> <p>13 disclosure. It is my view and my review of the record</p> <p>14 they probably would not have, but these are ultimately</p> <p>15 issues for the jury and for other experts to testify</p> <p>16 about.</p> <p>17 Q I think we now have agreement. I just want</p> <p>18 to get it clean.</p> <p>19 If the court or jury determines that the</p> <p>20 only violation of the DTPA in connection with Bernanke</p> <p>21 were a failure to disclose it, and that Google would</p> <p>22 have implemented Bernanke even if it were required to</p> <p>23 publicly disclose that program, then your calculations</p> <p>24 in section 6 cannot be used as penalties specifically</p> <p>25 for the failure to disclose Bernanke, fair?</p>
<p style="text-align: right;">Page 47</p> <p>1 programs were deceptive, yes, that the programs were</p> <p>2 deceptive, that those would be considered violations</p> <p>3 of the DTPA and other relevant statutes.</p> <p>4 Q So you have assumed in your calculation that</p> <p>5 the violation of the DTPA is something more than</p> <p>6 simply the alleged failure to disclose those programs,</p> <p>7 true?</p> <p>8 MR. COLLIER: Objection; form.</p> <p>9 THE WITNESS: That ultimately sounds like</p> <p>10 it's a jury determination. I consider it to be</p> <p>11 a -- the question is whether there is a deceptive</p> <p>12 act, whether, in implementing Bernanke, the way</p> <p>13 they implemented Bernanke constitutes deception</p> <p>14 under the statutes. I don't know the full legal</p> <p>15 requirements associated with that, but assuming</p> <p>16 that the jury comes back and says, we, the jury,</p> <p>17 find the following conduct to be a violation of</p> <p>18 the DTPA and the associated other statutes.</p> <p>19 If the jury finds that, that these are the</p> <p>20 violations, there are counts associated with</p> <p>21 those violations that Jeffrey Andrien and</p> <p>22 Dr. Wiggins have done. We can talk about those,</p> <p>23 but those -- whatever counts there are, those are</p> <p>24 the things that ultimately can be used to</p> <p>25 determine the appropriate deterrent penalty</p>	<p style="text-align: right;">Page 49</p> <p>1 MR. COLLIER: Objection; form.</p> <p>2 THE WITNESS: No, I would not say that.</p> <p>3 BY MR. DAVIS:</p> <p>4 Q Okay. So you would say that you have</p> <p>5 calculated penalties that can be used for the failure</p> <p>6 to disclose Bernanke, assuming that's the only</p> <p>7 violation and assuming that it would have been</p> <p>8 implemented even if there were a requirement of</p> <p>9 disclosure?</p> <p>10 A I think the jury could use the information</p> <p>11 that I provided and apply other factors to increase or</p> <p>12 potentially decrease those numbers.</p> <p>13 So, for example, there's a separate severity</p> <p>14 factor at least under consideration under the DTPA,</p> <p>15 and if it concluded that the severity of the conduct</p> <p>16 were really limited by a disclosure issue that would</p> <p>17 not have then had a substantial impact, then they</p> <p>18 could always reduce or adjust my numbers down, but I</p> <p>19 do think my numbers are -- provide a reasonable</p> <p>20 starting point and provide the economic basis from</p> <p>21 which the jury can start to figure out whether those</p> <p>22 numbers should be adjusted up or down or not at all.</p> <p>23 Q Is it your opinion that Google would not</p> <p>24 have implemented the Bernanke program if it were</p> <p>25 required to disclose it?</p>

<p style="text-align: right;">Page 50</p> <p>1 A I think you're going beyond the opinions  2 I've offered in this case. I would say the facts that  3 I see -- I have reviewed a substantial number of  4 documents and expert reports about the conduct at  5 issue, and I understand that Google took a lot of  6 efforts to conceal, or that's how -- my interpretation  7 of those documents is that it took efforts to conceal  8 the conduct, that the conduct itself involved specific  9 actions such as throttling things back and forth to  10 avoid detection.  11 All of that would inform my opinion,  12 generally, that I would not expect them to have  13 engaged in the, in the conduct absent a, absent the  14 deception. The deception, in some sense, was inherent  15 to the conduct. It simply wasn't an afterthought. It  16 wasn't like a separate administrative compliance  17 factor that somebody said, oh, I forgot to do it. It  18 was really part and parcel of the conduct.  19 So that's why I -- well, part of the reasons  20 why we've had this back and forth for the last hour is  21 I do see this is as somewhat inherent to the, to the  22 conduct at issue.  23 Q Have you seen any deposition testimony or  24 documents indicating to you that Google would not have  25 implemented RPO if it believed it had to disclose RPO?</p>	<p style="text-align: right;">Page 52</p> <p>1 THE WITNESS: Maybe I would -- I would need  2 to think about whether you would call them baked  3 into those calculations. There are -- some of  4 those are an estimate of the benefits actually  5 received from the deceptive conduct.  6 So there's a basic question, how much money  7 did Google make from implementing RPO, DRS, and  8 Bernanke. And so I have both an ex post and ex  9 ante framework on that. So that is more of a  10 factual issue, how much did they make. That's  11 my, my estimate of what they made.  12 I guess there's -- a different question  13 is -- and that's where this, this notion of a  14 but-for incrementalism is one where early on in  15 my report I describe how that's not the  16 appropriate perspective in this particular case.  17 BY MR. DAVIS:  18 Q If the jury determines that Google would  19 have implemented Bernanke even if it was required to  20 be disclosed and they had to disclose it and, in fact,  21 did so, how did they use your report to determine what  22 an appropriate penalty for Bernanke is?  23 MR. COLLIER: Objection; form.  24 THE WITNESS: Well, remember deterrent  25 penalties have two purposes. They have the</p>
<p style="text-align: right;">Page 51</p> <p>1 A Again, I would give you the same answer that  2 I just gave you. There are -- I don't recall the  3 specific documents I reviewed regarding the throttling  4 and which programs were throttled and which ones were  5 not, but I do expect, particularly within the, the  6 broader competitive landscape, that it would have been  7 a lot less likely for Google to have implemented these  8 programs individually or in their entirety absent the  9 deception, or absent the alleged deception, I should  10 say.  11 Q And, and the assumption or opinion that  12 Google would not have implemented these programs in a  13 world where it had to disclose them and did disclose  14 them is baked into your penalty calculations in  15 section 6, right?  16 MR. COLLIER: Objection; form.  17 THE WITNESS: I'm sorry. Say that to me one  18 more time.  19 BY MR. DAVIS:  20 Q The assumption or opinion that Google would  21 not have implemented these programs in a world in  22 which it had to disclose them and did disclose them is  23 baked into your penalty calculations in section 6,  24 right?  25 MR. COLLIER: Objection; form.</p>	<p style="text-align: right;">Page 53</p> <p>1 purpose of deterring the wrongdoer from  2 committing the offense in the future, but they  3 also have the purpose of committing others from  4 engaging in similar conduct -- deterring others  5 from engaging in similar conduct.  6 So I think there is a way in which, trying  7 to parse that out to finely; i.e., trying to back  8 out certain dollars from my estimates and  9 reducing that number to more of an incrementalism  10 approach, I think that is a, an approach that  11 could underdeter others from engaging in similar  12 conduct in the future.  13 But again, those are going to be ultimately  14 jury considerations, and that's one of the  15 reasons. There are other factors the jury can  16 consider.  17 BY MR. DAVIS:  18 Q So I, I may have asked a poor question. I  19 only want to be living in the world of the  20 calculations you're performing in section 6.  21 And if the jury wants to assess the gain  22 that Google reasonably expected to obtain from not  23 disclosing Bernanke, but believes that Google would  24 have implemented Bernanke anyway, even if they had to  25 disclose it, how do they use your report to figure out</p>



<p style="text-align: right;">Page 54</p> <p>1 that expected gain?</p> <p>2 MR. COLLIER: Objection; form.</p> <p>3 THE WITNESS: I guess I would need to think</p> <p>4 further on that, because ultimately, there's a</p> <p>5 lot of testimony by other experts about how the</p> <p>6 equilibrium prices were changed, about bidding</p> <p>7 behavior by other parties, so I would need to</p> <p>8 think about how that might factor into those</p> <p>9 calculations.</p> <p>10 I still consider it to be appropriately put</p> <p>11 into the bucket of a severity factor, that the</p> <p>12 conduct at issue, that the deception at issue is</p> <p>13 of a lesser type, so that the deception is not</p> <p>14 the conduct itself, but the -- or the full scope</p> <p>15 of the conduct, but the deception is a tiny</p> <p>16 sliver of that conduct.</p> <p>17 So back to my example of the, in my report,</p> <p>18 of the issuer of the, of the mortgages, for</p> <p>19 example. So it's the question of the incremental</p> <p>20 mortgages that they -- that the mortgage</p> <p>21 underwriter wrote, underwrote, that it wouldn't</p> <p>22 have underwritten in the but-for world. They may</p> <p>23 decide to use that particular lens to then say</p> <p>24 severity isn't really that -- of the conduct</p> <p>25 isn't that bad, and therefore we will reduce it</p>	<p style="text-align: right;">Page 56</p> <p>1 calculations comparing a world with Bernanke but</p> <p>2 disclosed to the actual world that the plaintiffs</p> <p>3 allege with Bernanke but undisclosed; is that fair?</p> <p>4 MR. COLLIER: Objection; form.</p> <p>5 THE WITNESS: I'm sorry. Could you repeat</p> <p>6 it one more time.</p> <p>7 BY MR. DAVIS:</p> <p>8 Q Yeah.</p> <p>9 You have not done an independent calculation</p> <p>10 comparing a world with Bernanke disclosed to the</p> <p>11 actual world that the plaintiffs allege with Bernanke</p> <p>12 but undisclosed; is that fair?</p> <p>13 A Well, again, I think I'm --</p> <p>14 MR. COLLIER: Objection; form.</p> <p>15 Again, Dr. DeRamus, give just a moment for</p> <p>16 me to get the objection to form out. The court</p> <p>17 reporter can only take one of us at a time.</p> <p>18 Go ahead.</p> <p>19 THE WITNESS: I think I still refer you back</p> <p>20 to my, my prior answer. I have not done a -- I</p> <p>21 have not estimated the bid shading type analysis,</p> <p>22 or the, the -- or yes, I would just say I have</p> <p>23 not done the type of bid shading analysis or</p> <p>24 estimates that I think you're asking about.</p> <p>25 I do think there are ways in which, given</p>
<p style="text-align: right;">Page 55</p> <p>1 accordingly.</p> <p>2 So I consider it more to fall into the</p> <p>3 severity factor. I still think it's -- that the</p> <p>4 numbers I have would be relevant for the jury to</p> <p>5 consider in that -- in, again, in section 6.</p> <p>6 BY MR. DAVIS:</p> <p>7 Q With respect to some of the work that other</p> <p>8 experts have performed about how equilibrium prices</p> <p>9 might change or bidding behavior might change in a</p> <p>10 world where Bernanke had been disclosed, have you</p> <p>11 performed a calculation estimating or calculating the</p> <p>12 gain that Google obtained strictly by failing to</p> <p>13 disclose Bernanke as opposed to by implementing it in</p> <p>14 its entirety?</p> <p>15 MR. COLLIER: Objection; form.</p> <p>16 THE WITNESS: If you're asking me if I have</p> <p>17 done a bid shading analysis, for example, the way</p> <p>18 Dr. Wiggins reports to do, no, I have not done a</p> <p>19 bid shading analysis. I reviewed the approach he</p> <p>20 used, and I reviewed testimony on other -- by</p> <p>21 other experts on that issue, but I have not done</p> <p>22 my own independent calculations of bid shading,</p> <p>23 for example.</p> <p>24 BY MR. DAVIS:</p> <p>25 Q So you have not done your own independent</p>	<p style="text-align: right;">Page 57</p> <p>1 the particularly the interconnected and dynamic</p> <p>2 nature of this market, that -- and the long-term</p> <p>3 benefits that Google obtained from the conduct,</p> <p>4 that -- I think that framework in particular is</p> <p>5 helpful to assess whether that type of analysis</p> <p>6 would meaningfully change my results, and I don't</p> <p>7 think it would.</p> <p>8 MR. COLLIER: Counsel, we've been going over</p> <p>9 an hour. Just when you hit the end of your</p> <p>10 section here. I'm not trying to interrupt you.</p> <p>11 MR. DAVIS: No, you're good, and I think</p> <p>12 we're about wrapped here.</p> <p>13 BY MR. DAVIS:</p> <p>14 Q Is it your understanding that plaintiffs'</p> <p>15 other experts have opined that the but-for world is</p> <p>16 one in which Bernanke, RPO, and DRS did not occur?</p> <p>17 And by "but-for world," I mean a hypothetical world in</p> <p>18 which there were no deceptive conduct.</p> <p>19 A Well, if you could point me to which</p> <p>20 specific experts you're talking about, that would be</p> <p>21 helpful. I think there is -- I mention Dr. Wiggins'</p> <p>22 report, whose report I'm rebutting in this case. I</p> <p>23 understand his perspective. I just don't recall</p> <p>24 everybody -- all the different experts' perspective.</p> <p>25 There are a number of experts that are</p>

15 (Pages 54 - 57)

<p style="text-align: right;">Page 58</p> <p>1 evaluating the conduct and evaluating the extent to</p> <p>2 which the conduct would have changed auction outcomes,</p> <p>3 the extent to which that conduct was deceptive or</p> <p>4 could be considered to be deceptive, as well as there</p> <p>5 are other experts opining on antitrust issues.</p> <p>6 Q I'm meaning to ask whether any of</p> <p>7 plaintiffs' experts, so one or more, in your view,</p> <p>8 have opined that the but-for world without deceptive</p> <p>9 conduct is one in which Google would not have</p> <p>10 implemented Bernanke, RPO, and DRS.</p> <p>11 MR. COLLIER: Objection; form.</p> <p>12 THE WITNESS: I just don't recall that being</p> <p>13 the scope of anybody else's testimony other than</p> <p>14 perhaps Dr. Wiggins', where -- I'm sorry -- where</p> <p>15 he was saying more that he's looking -- he's</p> <p>16 trying to estimate the world with disclosure.</p> <p>17 BY MR. DAVIS:</p> <p>18 Q And so sitting here right now, the only</p> <p>19 expert testimony that you can think of on the but-for</p> <p>20 world without deception is Dr. Wiggins', true?</p> <p>21 MR. COLLIER: Objection; form.</p> <p>22 THE WITNESS: I can say that he's the only</p> <p>23 expert who I saw whose -- who seems to explicitly</p> <p>24 articulate that that was the purpose of his</p> <p>25 calculations, is to, in a sense -- I don't -- I</p>	<p style="text-align: right;">Page 60</p> <p>1 BY MR. DAVIS:</p> <p>2 Q Okay. I think we can wrap up with one more</p> <p>3 question.</p> <p>4 So just to make sure I understand, you do</p> <p>5 disagree with the approach of trying to estimate the</p> <p>6 incremental impact on Google's revenues from</p> <p>7 disclosing versus failing to disclose Bernanke, RPO,</p> <p>8 and DRS?</p> <p>9 MR. COLLIER: Objection; form.</p> <p>10 BY MR. DAVIS:</p> <p>11 Q Right?</p> <p>12 A I disagree with the approach that</p> <p>13 Dr. Wiggins has done in his analysis, which I</p> <p>14 understand to be an attempt to estimate the</p> <p>15 incremental impact of disclosure. I don't think</p> <p>16 that's the right conceptual framework.</p> <p>17 I think that ignores the specifics of these</p> <p>18 markets, the interconnected nature of these markets.</p> <p>19 I think it ignores the long-term effects of, of these</p> <p>20 conducts and the, the broader conduct that we're</p> <p>21 talking about; i.e., it's not just about RPS and</p> <p>22 DRO -- I'm sorry -- it's not just about RPO and DRS</p> <p>23 and Bernanke, but it's about a broader course of</p> <p>24 conduct.</p> <p>25</p>
<p style="text-align: right;">Page 59</p> <p>1 can't recall if he calls it the but-for world. I</p> <p>2 think there are other experts who have opined on</p> <p>3 whether the conduct caused changes in the bidding</p> <p>4 behavior of different parties, but I don't.</p> <p>5 Again, I just -- I -- and others who have</p> <p>6 described the impact of that conduct on the</p> <p>7 broader ad tech ecosystem. The study -- I</p> <p>8 believe Dr. Rubin describes the snowball effect</p> <p>9 of that conduct, which, again, is considered in</p> <p>10 its more -- in its entirety in this aggregate</p> <p>11 sense as opposed to this but-for disclosure</p> <p>12 sense.</p> <p>13 So those are the ones I'm thinking of in</p> <p>14 trying to respond to your question. So the only</p> <p>15 one that I know who is explicitly positing a</p> <p>16 particular but-for world -- again, so to speak.</p> <p>17 I don't want to put words in Dr. Wiggins' mouth,</p> <p>18 but is one where he does explicitly state that he</p> <p>19 is trying to estimate a -- the incremental impact</p> <p>20 on the revenues of Google from disclosing or</p> <p>21 failing to disclose that particular -- the</p> <p>22 existence of those programs; again, an approach</p> <p>23 that I completely disagree with for all the</p> <p>24 reasons described in my report.</p> <p>25</p>	<p style="text-align: right;">Page 61</p> <p>1 Q Okay. I lied about one more question.</p> <p>2 Are your penalties meaning to -- excuse me.</p> <p>3 Are your calculations meaning to assess</p> <p>4 penalties for conduct outside of RPO, DRS, and</p> <p>5 Bernanke?</p> <p>6 MR. COLLIER: Objection.</p> <p>7 Again, just a second.</p> <p>8 Objection; form.</p> <p>9 Go ahead.</p> <p>10 THE WITNESS: Again, with the kind of</p> <p>11 running comment -- the running caveat that we've</p> <p>12 all been talking about, section 6, in section 6</p> <p>13 and 7, there is some interrelationship between 6</p> <p>14 and 7 in my report, but in 6, my estimate of the</p> <p>15 appropriate deterrent penalty amount or that</p> <p>16 range of deterrent penalty amounts is all derived</p> <p>17 based solely on DRS, RPO, and Bernanke.</p> <p>18 Those are the data inputs that I used in</p> <p>19 those calculations, but nonetheless, those also</p> <p>20 inform my opinion that those calculations in some</p> <p>21 sense slightly underestimate the benefits that</p> <p>22 Google obtained, and therefore, the appropriate</p> <p>23 deterrent penalty amount, if one were to apply</p> <p>24 that framework with complete information about</p> <p>25 the impact of all the different programs, and</p>

<p style="text-align: right;">Page 62</p> <p>1 particularly being able to incorporate these</p> <p>2 longer-term effects.</p> <p>3 And there are certain calculations in that</p> <p>4 section that don't even include longer-term</p> <p>5 effects, like the backward-looking approach, the,</p> <p>6 the ex post analysis that I describe in that</p> <p>7 section.</p> <p>8 BY MR. DAVIS:</p> <p>9 Q Are you able to answer in, in one sentence</p> <p>10 or less -- and I don't -- I'm not trying to get you to</p> <p>11 do that. I'm asking whether you are able to do it or</p> <p>12 not.</p> <p>13 Are you able to answer in one sentence or</p> <p>14 less whether you -- your calculations in section 6 of</p> <p>15 your report are trying to estimate, in the numerator,</p> <p>16 the incremental impact on Google from failing to</p> <p>17 disclose Bernanke, RPO, and DRS?</p> <p>18 MR. COLLIER: I'll object to form.</p> <p>19 Go ahead.</p> <p>20 THE WITNESS: I'm sorry. I'm just trying to</p> <p>21 figure out if I could answer it in one sentence.</p> <p>22 So that was the pending question. I think it's a</p> <p>23 more complicated answer that probably requires</p> <p>24 more than one sentence.</p> <p>25 MR. DAVIS: Okay. This is a good time for a</p>	<p style="text-align: right;">Page 64</p> <p>1 on the optimal amount -- strike that question, because</p> <p>2 I know that you explained it to me before.</p> <p>3 Can I start over?</p> <p>4 A Certainly.</p> <p>5 Q Have you ever before been retained to</p> <p>6 calculate ranges of civil penalties?</p> <p>7 MR. COLLIER: I'm going to object to form.</p> <p>8 Counsel, so I don't have to object based on</p> <p>9 a consulting expert privilege, are all of your</p> <p>10 questions about testimony or trial, him being a</p> <p>11 testifying expert?</p> <p>12 MR. DAVIS: Consulting expert in this case?</p> <p>13 MR. COLLIER: No. I really don't want to</p> <p>14 interrupt your question, which is why I just want</p> <p>15 to know, when you say "have you ever been</p> <p>16 retained to calculate ranges of IBM penalties,"</p> <p>17 if, say, IBM retains him as a consultant, he's</p> <p>18 not going to be able to testify as to that.</p> <p>19 MR. DAVIS: I think he can testify that it</p> <p>20 happened. I won't ask any details about it,</p> <p>21 yeah.</p> <p>22 MR. COLLIER: That's fine.</p> <p>23 BY MR. DAVIS:</p> <p>24 Q So same question: Have you ever been before</p> <p>25 been retained to calculate ranges of civil penalties?</p>
<p style="text-align: right;">Page 63</p> <p>1 break.</p> <p>2 THE VIDEOGRAPHER: The time is 10:26 a.m.</p> <p>3 This ends unit 1. We're off the record.</p> <p>4 (Whereupon, a short recess was taken.)</p> <p>5 THE VIDEOGRAPHER: The time is 10:42 a.m.</p> <p>6 This begins unit number 2. We're on the record.</p> <p>7 BY MR. DAVIS:</p> <p>8 Q Dr. DeRamus, you ready to proceed with your</p> <p>9 deposition?</p> <p>10 A Yes, I am.</p> <p>11 Q Have you been retained as an expert witness</p> <p>12 in trial or arbitration more or less than 75 times?</p> <p>13 A Sorry. You're throwing me with a specific</p> <p>14 number. I would need to go and look in my CV. I</p> <p>15 don't think -- well, I don't know. Me? I -- to be</p> <p>16 honest, I don't know. I would have to go look at my</p> <p>17 CV --</p> <p>18 Q I think that --</p> <p>19 A -- see what comes up.</p> <p>20 Q That will work.</p> <p>21 And all of the times that you've been</p> <p>22 retained as an expert witness in trial or arbitration,</p> <p>23 were you paid to do so?</p> <p>24 A I believe so, yes.</p> <p>25 Q Have you ever before been retained to opine</p>	<p style="text-align: right;">Page 65</p> <p>1 A I'm sorry. I'm just pausing, because I need</p> <p>2 to think about consulting, whether I'm able to</p> <p>3 disclose the fact whether or not I've been retained on</p> <p>4 a consulting basis, and whether I should include that</p> <p>5 in my calculation or not.</p> <p>6 I could say I have been engaged in prior</p> <p>7 proceedings where I submitted testimony in which my</p> <p>8 calculations were used as inputs for penalties, but I</p> <p>9 have not offered testimony, that I recall, that went</p> <p>10 to civil penalties the way they, the way they -- my</p> <p>11 understanding, the way they apply here.</p> <p>12 Q And, and what's distinct about what you're</p> <p>13 doing in this case versus giving calculations that are</p> <p>14 used as inputs for civil penalties?</p> <p>15 MR. COLLIER: Objection; form.</p> <p>16 THE WITNESS: Well, on my CV, I, I -- or on</p> <p>17 my list of prior testimony, I describe that I</p> <p>18 worked on behalf of the State of Texas in a</p> <p>19 matter adverse to Meta, and I describe in my CV</p> <p>20 the scope of my retention, or the scope of -- the</p> <p>21 general scope of what I was asked to do in that</p> <p>22 matter.</p> <p>23 I was also retained to testify in a matter</p> <p>24 involving an alleged violation of the Texas, I</p> <p>25 believe it's called the Theft Act, many years</p>

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1 ago, and -- actually, I believe there were --  
2 yeah, I'm sorry, it was just one, one proceeding  
3 in which those numbers may have been used. I  
4 don't -- or as part of a penalty calculation, but  
5 I was not deriving a, explicitly a, an amount in  
6 the way I think you're asking the question here.  
7 BY MR. DAVIS:  
8 Q Yeah, whereas in this case, you are deriving  
9 a specific amount of civil penalties, right?  
10 MR. COLLIER: Objection; form.  
11 THE WITNESS: That's correct. I'm deriving  
12 specific amounts, and my prior answers, I was  
13 referring to my testifying work.  
14 BY MR. DAVIS:  
15 Q And just as one kind of counter example, in  
16 the, in the Meta case, you calculated the number of  
17 alleged violations but not the, the, the penalties  
18 associated with those violations.  
19 Is that generally right?  
20 MR. COLLIER: I'm going to object to form.  
21 I will allow you to answer, Dr. DeRamus,  
22 generally, but none of us are under a protective  
23 order in that case, so I would caution you to  
24 stay at very high-level.  
25 THE WITNESS: Yes, and because of the

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1 protective order in that case, I, I would -- I'd  
2 probably point you to my previous answer, because  
3 I was trying to maintain within -- I was trying  
4 to stay within the bounds of the protective order  
5 in that case, and in my CV, I believe I disclose  
6 the extent to which my -- I worked on that, and  
7 the nature of my work on that, that I think -- so  
8 I think I answered that question in my previous  
9 answer. I just don't want to try it again and,  
10 and somehow stray outside the scope of the  
11 protective order.  
12 BY MR. DAVIS:  
13 Q Your CV accurately portrays what you did in  
14 the Facebook case, right?  
15 A That's correct.  
16 Q Did somebody else in the Facebook case  
17 calculate or derive actual civil penalties?  
18 MR. COLLIER: I'll object based on the  
19 protective order if you believe or if we need to  
20 discuss whether or not your discussion of another  
21 expert's testimony covered by that order is  
22 something you can disclose.  
23 MR. DAVIS: Do you want to go off?  
24 THE WITNESS: I'm sorry --  
25 MR. COLLIER: I just need to know if he

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1 needs to have a discussion.  
2 THE WITNESS: I don't need to have a  
3 discussion. I just need to think for a minute.  
4 Can you repeat the, the question, please.  
5 BY MR. DAVIS:  
6 Q Yeah.  
7 Did, did an expert other than you actually  
8 derive a quantum of civil penalties in the, in the  
9 Meta matter against the State of Texas?  
10 MR. COLLIER: Same objection and  
11 instruction.  
12 THE WITNESS: I don't believe so, not in  
13 terms of a testifying expert, but I don't, I  
14 don't recall whether there may have been others  
15 who were opining on that.  
16 BY MR. DAVIS:  
17 Q Do you have any experience or education in  
18 the -- in, in advertising?  
19 A It's a field -- well, I guess it depends how  
20 you ask the question.  
21 You mean the field of advertising as a  
22 profession, to be an advertiser, or do you mean the  
23 economics of advertising?  
24 Q Well, I guess we'll start with the first  
25 one.

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1 Do you have any experience working in  
2 advertising?  
3 A Not in the advertising sector, per se. I  
4 have worked on issues that dealt with advertising.  
5 Q And do you have any experience or education,  
6 I'm adding or education to this question, in digital  
7 advertising specifically?  
8 A I have some experience in digital  
9 advertising based on some of my prior work, but not --  
10 maybe -- unless you're asking the question from the  
11 perspective of have I worked for an advertiser or for  
12 a company selling ad tech, for example. I have not  
13 done that level of, of work. I've, I've been working  
14 as an economist my entire career.  
15 Q And in your work as an economist, do you  
16 have any experience or education in auction theory?  
17 A Yes.  
18 Q And tell me about that.  
19 A Well, auction theory is probably fundamental  
20 to the question of price formation, or at least in  
21 certain markets, and it is something that I have  
22 studied periodically and worked on at times more  
23 intensively and other times less intensively.  
24 I've worked extensively on electricity  
25 markets, and many of those markets have auctions, and

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1 there have been several dispute proceedings about  
2 those, some of those markets at least, and I testified  
3 about the auction design in those markets and, and the  
4 impact of alleged misconduct on market outcomes.  
5 Q When you decided to get a Ph.D. in  
6 economics, what were you wanting to do professionally?  
7 A Well, I, I wanted to, to actually work in,  
8 initially, in international development. I had been  
9 working in the Peace Corps for several years, and that  
10 was my -- I would say my first love was the field of  
11 international development, but as I continued my  
12 course of study, I became interested in industrial  
13 organization, which is the theory of price, how price  
14 is formed, study of industries. It's also the area  
15 where probably law and economics starts to raise its  
16 head, and it's also the area of antitrust.  
17 Q Did you ever think about becoming an  
18 economics professor?  
19 A I thought about it, but it was not one -- I  
20 would not say that was my aspiration.  
21 Q Did you ever try to become an economics  
22 professor?  
23 A No. Other than -- well, by "professor," I,  
24 I assume you mean a full-time faculty member at a  
25 college or university, so the answer is no. I've --

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1 yes, I'll just leave it at that.  
2 Q In connection with this case, did you  
3 interview or communicate with any digital advertisers?  
4 A No.  
5 Q And same question.  
6 Did you interview or communicate with any  
7 digital publishers?  
8 A No.  
9 Q And same question as to ad tech providers.  
10 A No.  
11 Q I know there are a little over a hundred  
12 depositions referenced in the appendix to your report.  
13 Does that mean that you had access to those  
14 depositions or that you read them?  
15 A It means I had -- well, I had access to a  
16 much broader set of documents. I think I had access  
17 to the entire Reveal database, which is where I  
18 understand all of the Google production is, and so I  
19 had access to a much broader range of documents, but I  
20 would say, particularly in the materials considered, I  
21 would say those are ones that I had access to that  
22 might have some relevance to what I'm -- the opinions  
23 I'm providing here, as opposed to that broader  
24 universe of millions of pages of -- or other millions  
25 of pages of documents in a broader production.

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1 Q Other than the depositions cited in your  
2 report, can you tell me any depositions you read?  
3 A [REDACTED] is probably the one that I recall  
4 most recently, [REDACTED]. I have read Mr. Pichai's  
5 deposition, P-I-C-H-A-I, I believe, and actually, that  
6 one I read prior to submitting my report, so I  
7 probably should have put that on my list of materials  
8 considered or relied upon. I read Mr. Brin's  
9 deposition, which came in after my report. I reviewed  
10 the depositions of several individuals, but I believe  
11 those are cited in my report, the ones that are  
12 describing certain documents that I rely upon in my,  
13 in my calculations. Those would be what I consider  
14 the, the core depositions to my report.  
15 Q Do you remember when you were retained in  
16 this case?  
17 A Yes.  
18 Q Was it August 1 of this year?  
19 A No.  
20 Q When was it?  
21 A August 14.  
22 Q And then you issued your report on  
23 September 9, right?  
24 A Correct.  
25 Q Am I remembering correctly that that report

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1 was originally going to be due on September 1, and  
2 then there was a sort of joint extension to  
3 September 9?  
4 A I do recall there being discussions about an  
5 extension. I just don't recall the original date.  
6 Q Do you feel like --  
7 A I remember it was earlier than September the  
8 9th.  
9 Q Do you usually have longer than that to  
10 prepare an expert report?  
11 MR. COLLIER: Objection; form.  
12 THE WITNESS: In terms of frequency, yes,  
13 most of the times I do have longer than  
14 approximately three weeks to prepare an expert  
15 report.  
16 BY MR. DAVIS:  
17 Q Would you characterize the facts of this  
18 case as complex?  
19 A I would say yes. There are a lot of facts,  
20 so in that sense, it is complex. There's a lot of  
21 different conduct. The number of -- so there, there  
22 are complexities associated with this industry and  
23 this case, but there are similar complexities in a lot  
24 of my other work as well, so I don't want to say that  
25 my other work is necessarily simple, but I would say



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1 this has certain complexities to it, yes.  
2 Q With, with respect to -- well, I should --  
3 can I start over?  
4 A Yes.  
5 Q By the way, that's a trick that lawyers do  
6 so that then in the transcript I'll have a clean  
7 question as opposed to looking like a moron for  
8 stopping in the middle.  
9 So can I start a new question?  
10 A You can.  
11 Q Your analysis in this case starts from the  
12 assumption that the factfinder has found Google to  
13 have violated the DTPA, right?  
14 A Correct.  
15 Q You are not yourself offering the opinion  
16 that Google violated the DTPA, correct?  
17 A I am not offering what sounds like would be  
18 a legal or -- the, the province of the jury. I'm not  
19 offering any kind of legal conclusions or legal  
20 opinions, nor am offering -- nor am I trying to step  
21 into the province of the jury.  
22 Q Are you offering the opinion that Google's  
23 practices were actually deceptive?  
24 A Well, to the extent that "deceptive" is, is  
25 a freighted term in this context, because the claims

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1 at issue, the legal claims go to the question of  
2 deception, to be clear, I am not offering a, an  
3 opinion about whether they are literal violations of  
4 the statute. That goes maybe to the -- consistent  
5 with my prior answer.  
6 I have reviewed the documents, and as I said  
7 earlier this morning, there were certain aspects of  
8 Google's conduct that I took into consideration in my  
9 analysis, and I think there are ways in which that  
10 does -- informs my opinion as to the likely deceptive  
11 nature of that conduct, but I would -- ultimately,  
12 the, the core conduct issues and the extent of whether  
13 they were -- the conducts were deceptive, is a subject  
14 of interest by the other experts, as a, as a, as a  
15 matter of, of expert opinion.  
16 Q Are you offering any opinions regarding what  
17 information, if any, is material to Google's ad tech  
18 customers, namely, advertisers and publishers?  
19 MR. COLLIER: Object to form.  
20 THE WITNESS: Well, I would say there, there  
21 are probably other experts that I would defer to  
22 who have a greater -- who have studied that issue  
23 probably in greater detail than I have. I do  
24 think as an economist, in, in understanding how  
25 auction markets work and how these markets work,

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1 I do have some of my own views as to what  
2 information I think would be material to other  
3 participants, but ultimately, kind of the  
4 ultimate determination of that is probably -- I  
5 would probably direct -- or the ultimate opinions  
6 on that, I would probably direct you toward the  
7 other industry experts, but I don't want to, to  
8 close off the fact that I have had extensive  
9 experience with auctions.  
10 I know how machine-learning technologies  
11 work. I have applied machine-learning type  
12 algorithms in the past. I have an understanding  
13 of how changes in auction rules, the hidden  
14 changes in auction rules can affect behavior of  
15 bidders in auctions. That's been part of my  
16 prior work, so I have an independent  
17 understanding of that, but ultimately, with  
18 regard to the very specific conduct at issue here  
19 and the specific nature of that, I think  
20 there's -- there are other experts who have, who  
21 have done a more, what I would call a deep dive  
22 analysis of those issues.  
23 I would say I, I know Dr. Wiggins makes  
24 certain statements about what information is  
25 material and, and how bidders may have changed

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1 their behavior with the additional information or  
2 may not have changed their behavior. I have  
3 reviewed that, so I have an opinion on those  
4 issues and on his testimony, but I would say  
5 ultimately, maybe the bigger question of very --  
6 or very specific questions about what exactly is  
7 material and immaterial would be something I  
8 would point you to other experts for.  
9 BY MR. DAVIS:  
10 Q You know how in more what I think of as  
11 ordinary cases, I'm not asking you to sign onto that  
12 language, but that we often talk in terms of liability  
13 experts and damages experts in different sorts of  
14 cases than this?  
15 A I understand the distinction, yes.  
16 Q As applied to this case, are you more like a  
17 damages expert than a liability expert?  
18 MR. COLLIER: Object to form.  
19 THE WITNESS: Well, I am ultimately -- well,  
20 I guess trying to adopt your use of a simile, so  
21 yes, I am. I would say I'm more like a damages  
22 expert in the sense that I am quantifying a  
23 appropriate deterrent penalty amount. I don't  
24 think deterrent penalties are necessarily the  
25 same thing as damages -- as -- I do not think

<p style="text-align: right;">Page 78</p> <p>1 that deterrent penalties are necessarily the same</p> <p>2 as damages.</p> <p>3 I do think, not only in my work here in</p> <p>4 assessing an appropriate deterrent penalty</p> <p>5 amount, but also in my other work where I am a</p> <p>6 damages expert, I think it is appropriate for the</p> <p>7 economist or the expert to understand the conduct</p> <p>8 at issue and to factor in their understanding of</p> <p>9 that conduct in deriving an appropriate monetary</p> <p>10 penalty, whether it's a damage number or whether</p> <p>11 it's a deterrent penalty.</p> <p>12 So I've had -- I've spent a significant</p> <p>13 amount of time reviewing the documents, the</p> <p>14 industry, and other expert reports on the conduct</p> <p>15 at issue to inform my opinion about an</p> <p>16 appropriate deterrent penalty amount.</p> <p>17 BY MR. DAVIS:</p> <p>18 Q And if you were explaining to a layperson</p> <p>19 what your role is in this case, how would you explain</p> <p>20 it?</p> <p>21 A I would point them to paragraph 1, I</p> <p>22 believe, of my -- or maybe it's paragraph 2, where</p> <p>23 I -- of my report, where I describe my assignment, and</p> <p>24 I'm happy to do that if you would provide me my</p> <p>25 report.</p>	<p style="text-align: right;">Page 80</p> <p>1 BY MR. DAVIS:</p> <p>2 Q And you need to know what the conduct that</p> <p>3 is unlawful is, right?</p> <p>4 A Correct. I need to understand the nature of</p> <p>5 the conduct in dispute and the claims made, the claims</p> <p>6 brought by the plaintiff states, and, and the</p> <p>7 broader -- and understanding that broader conduct,</p> <p>8 which is one of the reasons I, I reviewed the expert</p> <p>9 reports of the number of witnesses who describe that</p> <p>10 conduct.</p> <p>11 Q In connection with your analysis in section</p> <p>12 6 and section 7 of your report, what conduct are you</p> <p>13 assuming the jury to have found unlawful?</p> <p>14 MR. COLLIER: Objection; form.</p> <p>15 THE WITNESS: In section 6, I'm assuming</p> <p>16 that the jury has found the conduct related to</p> <p>17 Bernanke, RPS -- I'm sorry -- Bernanke, RPO, and</p> <p>18 DRS to be unlawful. I, I think in my -- in our</p> <p>19 prior discussion this morning, I described how I</p> <p>20 did take into consideration some of the broader</p> <p>21 course of conduct; i.e., there are some other</p> <p>22 bidding strategies that the various experts have</p> <p>23 discussed in addition to those three that may</p> <p>24 have been deceptive as well. That factors into</p> <p>25 my opinion, although it does not necessarily</p>
<p style="text-align: right;">Page 79</p> <p>1 Q No, that's good.</p> <p>2 From, from where do you derive your</p> <p>3 understanding of what the plaintiffs allege to have</p> <p>4 been unlawful conduct under the DTPA?</p> <p>5 A Well, I read the Fourth Amended Complaint.</p> <p>6 I read the Dr. Weinberg's and Dr. Chandler's opening</p> <p>7 reports. I would say that's how I began my analysis,</p> <p>8 and I reviewed some of the documents in this case. I</p> <p>9 have -- I'm sorry.</p> <p>10 Are you, are you asking at the time I</p> <p>11 started the engagement, or are you asking as of today?</p> <p>12 Q Maybe neither. I'm meaning to ask -- and I</p> <p>13 can do it in two questions. I'll break it up.</p> <p>14 To, to begin your penalty analysis, you have</p> <p>15 to start with a determination of what was unlawful,</p> <p>16 right?</p> <p>17 MR. COLLIER: Objection; form.</p> <p>18 THE WITNESS: I have to start with, with an</p> <p>19 analysis of the conduct. I have to understand</p> <p>20 what conduct is at issue, but maybe I</p> <p>21 misunderstood the question.</p> <p>22 I, I did not determine something is</p> <p>23 unlawful. I'm assuming that the jury finds that</p> <p>24 the defendant has engaged in unlawful conduct in</p> <p>25 violation of the DTPA and related state statutes.</p>	<p style="text-align: right;">Page 81</p> <p>1 factor into those calculations in section 6.</p> <p>2 The -- section 3 of my report, I believe,</p> <p>3 goes through the conduct and references the</p> <p>4 specific bidding strategies or, or rather</p> <p>5 programmatic changes that Google made. So I</p> <p>6 probably point you to those, because ultimately</p> <p>7 in section 7, it really is more of a holistic</p> <p>8 look at the -- that conduct, broader course of</p> <p>9 conduct.</p> <p>10 BY MR. DAVIS:</p> <p>11 Q So taking them one at a time, in connection</p> <p>12 with section 6 of your report, do you start with the</p> <p>13 assumption that the jury has found that the</p> <p>14 implementation of Bernanke was unlawful?</p> <p>15 A I start with the conclusion that the jury</p> <p>16 has found that Bernanke -- the implementation of</p> <p>17 Bernanke involved deception. So whether -- how you</p> <p>18 parse it out any finer than that, I'm not quite sure.</p> <p>19 I think we're back to our previous debate.</p> <p>20 Q And, and I'm not -- I'm trying to get away</p> <p>21 from the debate and just make sure I know what you're</p> <p>22 starting from.</p> <p>23 Are you starting from the premise that every</p> <p>24 dollar of profit to Google resulting from Bernanke</p> <p>25 should be included in the penalty calculation?</p>



<p style="text-align: right;">Page 82</p> <p>1 MR. COLLIER: Objection; form.</p> <p>2 THE WITNESS: I'm starting -- those</p> <p>3 calculations in section 6 do start from the</p> <p>4 premise that the incremental dollars and the</p> <p>5 incremental profits from Bernanke should be part</p> <p>6 of the deterrent penalty calculation from an</p> <p>7 economic perspective.</p> <p>8 BY MR. DAVIS:</p> <p>9 Q And so that would be comparing the world in</p> <p>10 which Google did implement Bernanke to a world in</p> <p>11 which, holding everything else constant, no Bernanke</p> <p>12 ever happened, right?</p> <p>13 A Well, again, unfortunately, I think we are</p> <p>14 back into our prior debate about the but-for world. I</p> <p>15 think the question is -- from a penalty calculation,</p> <p>16 the question is -- or deterrent penalty calculation</p> <p>17 perspective, the question is what was the benefit from</p> <p>18 the deceptive conduct.</p> <p>19 So this is the -- I can -- the, the</p> <p>20 calculations are very clear. It's what is the -- and</p> <p>21 the source of those, the data inputs for those</p> <p>22 calculations are very clear: What are the incremental</p> <p>23 revenues coming from the Bernanke program.</p> <p>24 Q Gotcha.</p> <p>25 Is, is it your understanding that the</p>	<p style="text-align: right;">Page 84</p> <p>1 put a caveat on that, just because it is -- in terms</p> <p>2 of the calculation that I did, that is a correct</p> <p>3 interpretation of my calculations.</p> <p>4 I think there is a, kind of a broader</p> <p>5 framework that I am applying to understand the</p> <p>6 long-term nature of Google's conduct or the long-term</p> <p>7 effects and long-term benefits that Google's conduct</p> <p>8 would have provided it, but in terms of the specific</p> <p>9 calculations, that takes -- those calculations in</p> <p>10 section 6 take the incremental profits or my estimate</p> <p>11 of the expected incremental revenues and profits from</p> <p>12 each of those three programs, and then calculates an</p> <p>13 appropriate deterrent penalty amount based on those</p> <p>14 numbers.</p> <p>15 Q As an economist, do you agree that there are</p> <p>16 social welfare enhancing reasons that companies</p> <p>17 sometimes do not disclose certain information?</p> <p>18 MR. COLLIER: Objection; form.</p> <p>19 THE WITNESS: In certain circumstances, I</p> <p>20 would agree with that, yes.</p> <p>21 BY MR. DAVIS:</p> <p>22 Q Would that include things like intellectual</p> <p>23 property?</p> <p>24 A In a long, roundabout way, yes, I agree.</p> <p>25 Q Would that include things like source code</p>
<p style="text-align: right;">Page 83</p> <p>1 plaintiffs allege that the use of Bernanke was itself</p> <p>2 unlawful?</p> <p>3 MR. COLLIER: Objection; form.</p> <p>4 THE WITNESS: It's my understanding that the</p> <p>5 plaintiffs have alleged that the -- that Google</p> <p>6 has engaged in deceptive conduct, and that is</p> <p>7 the -- its implementation of Bernanke involved</p> <p>8 deception. I, I don't want to step in the, in</p> <p>9 the, in the shoes of the plaintiffs on this case,</p> <p>10 because they -- the plaintiffs have their claims.</p> <p>11 I don't -- that's -- but I would say that's</p> <p>12 generally my understanding.</p> <p>13 BY MR. DAVIS:</p> <p>14 Q All right. I think we've got it.</p> <p>15 I have to do it for each one.</p> <p>16 With respect to DRS in section 6 of your</p> <p>17 report, are you beginning the calculation with every</p> <p>18 dollar of profit that you believe Google expected to</p> <p>19 derive as a result of DRS?</p> <p>20 A Yes.</p> <p>21 Q And with respect to RPO in section 6 of your</p> <p>22 report, are you starting the calculation with every</p> <p>23 dollar of profit that you believe Google expected to</p> <p>24 derive as a result of RPO?</p> <p>25 A Yes, but -- I'm sorry. I should probably</p>	<p style="text-align: right;">Page 85</p> <p>1 for tech companies?</p> <p>2 A Well, again, I -- when I said "a long,</p> <p>3 roundabout way," I think there are social welfare</p> <p>4 enhancing reasons why companies provide source code to</p> <p>5 the public, so there are open-source code or open --</p> <p>6 or those are often welfare enhancing, social welfare</p> <p>7 enhancing actions, but I can also understand other</p> <p>8 reasons why companies are allowed to keep intellectual</p> <p>9 property, including source code, private and protected</p> <p>10 under a copyright or trademark law -- or, or patent</p> <p>11 law.</p> <p>12 Q And from an economist's perspective, at</p> <p>13 least one of those reasons is to incentivize companies</p> <p>14 to innovate, right?</p> <p>15 A That's correct.</p> <p>16 Q I don't usually do this, but I am going</p> <p>17 to -- we are now going to talk about the probability</p> <p>18 of detection and enforcement.</p> <p>19 Do you think it's likely that the</p> <p>20 probability of detection for RPO, DRS, and Bernanke</p> <p>21 were identical as to each program?</p> <p>22 MR. COLLIER: Objection; form.</p> <p>23 THE WITNESS: Well, I think you need -- one,</p> <p>24 I would make sure, just so the record is clear,</p> <p>25 that in my report I often -- or I generally,</p>

<p style="text-align: right;">Page 86</p> <p>1 hopefully, describe the probability that I'm</p> <p>2 interested in as the probability of detection,</p> <p>3 enforcement, and collection of a monetary penalty</p> <p>4 collectively. That's ultimately the probability</p> <p>5 that I'm considering to be most relevant for</p> <p>6 determining a deterrent penalty amount, and I</p> <p>7 describe the differences between those.</p> <p>8 You can consider the probability of</p> <p>9 detection alone, separately from the probability</p> <p>10 of, of enforcement, separately from the</p> <p>11 probability of, of collection, and I think</p> <p>12 there's a multiplicative approach you need to do</p> <p>13 to derive that sum total, but the perspective is</p> <p>14 more from the -- ultimately from the enforcement</p> <p>15 perspective, as opposed to just a generalized</p> <p>16 detection.</p> <p>17 So, for example, consumers might -- or users</p> <p>18 of a product might be able to detect a particular</p> <p>19 course of conduct that's very different from the</p> <p>20 perspective that I'm applying here, which is the</p> <p>21 detection of an actionable conduct under the</p> <p>22 relevant statutes.</p> <p>23 BY MR. DAVIS:</p> <p>24 Q Using that definition of the relevant</p> <p>25 probability, do you think it's likely that it was</p>	<p style="text-align: right;">Page 88</p> <p>1 which the combination of, of conduct might make</p> <p>2 detection more difficult, and in certain circumstances</p> <p>3 here, I think that is the -- I think there is -- there</p> <p>4 are elements of that as well.</p> <p>5 MR. COLLIER: Counsel, one second.</p> <p>6 Dr. DeRamus, I see the court reporter</p> <p>7 struggling at times, and now she's nodding, to</p> <p>8 keep up with you. I would just ask -- at times</p> <p>9 you're going very fast. Can you just slow the</p> <p>10 cadence down just a hair.</p> <p>11 THE WITNESS: I will, or I will try, and I</p> <p>12 appreciate the reminder.</p> <p>13 BY MR. DAVIS:</p> <p>14 Q If -- holding everything else equal, if a</p> <p>15 wrongdoer engages in wrongful conduct for five years</p> <p>16 rather than one year, doesn't it become more likely</p> <p>17 over time that the wrongful conduct will be detected?</p> <p>18 MR. COLLIER: Objection; form.</p> <p>19 THE WITNESS: Potentially. It would depend</p> <p>20 on the type of conduct, whether the conduct</p> <p>21 effectively gets baked into expectations; i.e.,</p> <p>22 the market signal that someone sees five years</p> <p>23 after the conduct, that might become viewed as</p> <p>24 the norm, as opposed to the moment in which the</p> <p>25 conduct is initially -- that conduct initially</p>
<p style="text-align: right;">Page 87</p> <p>1 identical for each of RPO, DRS, and Bernanke</p> <p>2 respectively?</p> <p>3 MR. COLLIER: Objection; form.</p> <p>4 THE WITNESS: I think within -- to a</p> <p>5 reasonable -- given the range of uncertainty</p> <p>6 associated with that particular parameter, I</p> <p>7 would say it's reasonable to apply the similar</p> <p>8 probably of detection enforcement and collection</p> <p>9 for the -- for those conducts.</p> <p>10 BY MR. DAVIS:</p> <p>11 Q If a wrongdoer engages in three forms of</p> <p>12 unlawful conduct rather than one, does that make it</p> <p>13 more likely that the conduct will be detected?</p> <p>14 A I think it would depend on the specific</p> <p>15 conduct. Some conduct, the more may be obfuscating</p> <p>16 the signal of a single course of conduct, for example.</p> <p>17 So if you are both a price fixer and a monopolist,</p> <p>18 which is kind of hard to think about, but maybe</p> <p>19 somebody has monopoly power and also --</p> <p>20 Q And is charitable.</p> <p>21 A -- engages in a price-fixing conspiracy with</p> <p>22 a very small competitor, then you'd have to separate</p> <p>23 out the degree to which that price increase resulted</p> <p>24 from the monopoly power versus from the agreement.</p> <p>25 So there -- I think there's lots of ways in</p>	<p style="text-align: right;">Page 89</p> <p>1 starts, but I think -- so that's why I think it</p> <p>2 depends.</p> <p>3 BY MR. DAVIS:</p> <p>4 Q In estimating a range of probabilities in</p> <p>5 this case, did you account for how long Google</p> <p>6 expected each program to last?</p> <p>7 A I looked for information on that regard. I</p> <p>8 did not see anything suggesting that they expected a</p> <p>9 given program to be limited in time, and the -- I, I</p> <p>10 also observed instances in which there were constant</p> <p>11 improvements or, from Google's perspective,</p> <p>12 improvements to the particular programs, the various</p> <p>13 versions of the program and the expansion of those</p> <p>14 programs over time, the application of it, to</p> <p>15 different types of customers, and continued</p> <p>16 investments associated with those programs.</p> <p>17 So all of that led me to conclude that there</p> <p>18 was nothing to indicate that they were limited in</p> <p>19 time, and I think I describe that in my report, but</p> <p>20 nonetheless, I provide different calculations showing</p> <p>21 a limitation to a 20-year term in one of the</p> <p>22 calculations to account for that potential.</p> <p>23 Q The calculation without limitation to a</p> <p>24 20-year term starts with the assumption that the, the</p> <p>25 programs would go on for more than 20 years, right?</p>

<p style="text-align: right;">Page 90</p> <p>1 A Correct, that the expectation at the time  2 was that there was a, a change in the business. There  3 was an implementation of a program that was going to  4 generate cash flows, and based on standard financial  5 principles, I then derived the expectation, the, the  6 net present value of those future cash flows, which  7 effectively assumes that it goes on beyond -- that the  8 expectation that it would go on beyond 20 years.  9 Q And did you adjust the probability of  10 detection to account for the fact that those  11 calculations assume that the deceptive conduct goes on  12 for more than 20 years?  13 A I guess the short answer is I did not change  14 the probability factors. I have a range of  15 probability factors that range from ten percent to  16 33 percent. I think the -- that range could  17 reasonably be considered to encompass conduct that  18 occurs over a very long period of time.  19 For example, some of those are derived from  20 estimates of price-fixing conspiracies, other types of  21 corporate misconduct as opposed to -- that occurs over  22 time as opposed to a single act like a theft, for  23 example.  24 So I think the range that I provided can  25 encompass an alternative assessment of what the</p>	<p style="text-align: right;">Page 92</p> <p>1 forces me to pay a monetary fine, which may be very  2 different from a customer noticing there's something  3 wrong or even complaining to an enforcer about that  4 particular conduct.  5 Q How come?  6 MR. COLLIER: Objection; form.  7 THE WITNESS: Because that is what goes to  8 the fundamental calculus of the wrongdoer in the  9 deterrent enforcement framework, that the  10 calculus is based on expected benefits versus  11 expected cost, and the cost to them of engaging  12 in the conduct is the, the penalty resulting from  13 that conduct.  14 BY MR. DAVIS:  15 Q I meant to ask: How, how come the  16 probability of enforcement and punishment is very  17 different than the probability that customers will  18 notice the deceptive conduct?  19 A Well, as I describe in my report, there are  20 various factors, and I'm happy to, again, go to my  21 report if you like, but I describe various factors  22 that may cause there to be constraints on enforcement  23 budgets. There are also -- in the literature, there  24 are broader considerations about enforcement costs,  25 that there is a societal cost to enforcement, that you</p>
<p style="text-align: right;">Page 91</p> <p>1 appropriate penalty -- the appropriate probability of  2 detection, enforcement, and collection is over a  3 broader time period.  4 Q One thing you mentioned before is that the  5 detection of actionable conduct under the relevant  6 statutes is very different from a product's customers  7 detecting the conduct, that those are two different  8 probabilities.  9 Am I capturing that correctly?  10 A As I think about that, I would say yes, I  11 consider, I consider those to be distinct questions,  12 yes.  13 Q How come?  14 A Because I am charged with responding to  15 Dr. Wiggins in terms of what is the appropriate  16 monetary penalty in this case and what's -- and what  17 is the framework that should, that should be applied  18 in that, in deriving that monetary penalty, and from  19 the deterrent perspective, that the appropriate  20 perspective is an enforcement perspective.  21 It is if I engage in actionable conduct,  22 what is the probability that I am caught by an  23 enforcer, and what is the probability that enforcer  24 actually brings a case against me, and what is the  25 probability that I have a judgment against me that</p>	<p style="text-align: right;">Page 93</p> <p>1 can basically increase the probability of detection if  2 you devote all the society's resources to punishing  3 wrongdoers.  4 So there -- that's, to some extent, an  5 endogenous variable that depends on the amount of  6 resources that the -- that society decides to allocate  7 to that particular activity.  8 Q Do you have a copy of your report?  9 A Not with me.  10 Q I'm going to give you this. I'll let you  11 know it is the version pre-Friday's amendment, but I  12 don't have questions about those numbers, and if I do,  13 I will use the new version. These are just fancier  14 and bound.  15 THE REPORTER: Is that an exhibit?  16 MR. DAVIS: No. I promise.  17 MR. COLLIER: Counsel, just so the, the  18 record is clear -- I have no objection to this,  19 by the way, and I've got a copy.  20 Just so the record is clear, we served a  21 corrected version. It changed some numbers in  22 some worksheets, and you've provided him the  23 older version. I don't think your questions are  24 going to change based on the corrected version.  25 Is that fair?</p>

<p style="text-align: right;">Page 94</p> <p>1 MR. DAVIS: Correct.</p> <p>2 MR. COLLIER: Okay. Sorry. Go ahead.</p> <p>3 BY MR. DAVIS:</p> <p>4 Q If you look at paragraph 103, please. It's</p> <p>5 on page 54.</p> <p>6 A Could you give me a minute? Should I -- I</p> <p>7 found the place. Would you -- if you want me to read</p> <p>8 that paragraph now or after you ask me the question,</p> <p>9 I'm happy to.</p> <p>10 Q I don't have a question about the whole</p> <p>11 paragraph.</p> <p>12 Is this the paragraph in your report from</p> <p>13 which you derive the ten percent to 33 percent</p> <p>14 probability of detection range?</p> <p>15 A I would say that entire section is where I</p> <p>16 derive that.</p> <p>17 Q Are there any other numerical probabilities</p> <p>18 outside of paragraph 103 in that section?</p> <p>19 A Well, I'm -- paragraph 104, 105, all the way</p> <p>20 through 108, and then the various references in those</p> <p>21 footnotes all inform my opinion as to the reasonable</p> <p>22 range of numbers that I think is appropriate.</p> <p>23 So, for example, I describe in paragraph 107</p> <p>24 the use of a 33 percent probability of detection and</p> <p>25 it's consistency with the trebling of damages under</p>	<p style="text-align: right;">Page 96</p> <p>1 A Counsel, just for the -- to save time, I</p> <p>2 don't want to read into the record the entirety of</p> <p>3 that section, but I went through a fairly extensive</p> <p>4 description of my reasoning, and so I would point you</p> <p>5 to that as being the basis for my conclusion. It's</p> <p>6 not simply that I took one particular study and used</p> <p>7 that as being the appropriate number to use, and it's</p> <p>8 one of the reasons why I provide a range. It's for</p> <p>9 the reasons I describe in the -- in this particular</p> <p>10 section.</p> <p>11 Q Other than the studies about price-fixing</p> <p>12 cartels, can you give me an example of a comparable</p> <p>13 crime or offense for which there is research on the</p> <p>14 probability of detection?</p> <p>15 A Well, some of these other studies cited do</p> <p>16 reference those other crimes.</p> <p>17 Q What are those crimes?</p> <p>18 A Again, give me, give me a minute to review</p> <p>19 that section, because I believe I will -- well, first</p> <p>20 just point you to footnote -- the last sentence of</p> <p>21 103, where I talk about the detection of a</p> <p>22 price-fixing cartel within a range being -- within the</p> <p>23 range of ten to 33 percent, and now I'm quoting,</p> <p>24 "which is consistent with those observed for certain</p> <p>25 other crimes, such as burglary, automobile theft, and</p>
<p style="text-align: right;">Page 95</p> <p>1 antitrust laws as being informative of my -- as, as</p> <p>2 informing my opinion.</p> <p>3 So I would still direct you to the entirety</p> <p>4 of that section as being the basis for my opinion, not</p> <p>5 simply the numbers alone that are in paragraph 103.</p> <p>6 Q Okay. As far as studies of actual</p> <p>7 probabilities of detection, I see one in paragraph</p> <p>8 103, which is, as I understand it, the Bryant and</p> <p>9 Eckart study, and then I see another one in footnote</p> <p>10 191, which is the Combe, C-O-M-B-E, study.</p> <p>11 Do you see both of those?</p> <p>12 A I see both of those, but I see there are</p> <p>13 other ones as well. I also, I, I also reference the</p> <p>14 Polinsky and Shavell article in that same footnote,</p> <p>15 for example.</p> <p>16 Q I just mean to ask whether you see those two</p> <p>17 things.</p> <p>18 A Oh, yes. So I'm sorry. I do see the</p> <p>19 reference to the Combe and the Bryant and Eckart</p> <p>20 study.</p> <p>21 Q And is it your opinion that the probability</p> <p>22 of detection, enforcement, and punishment for</p> <p>23 price-fixing cartels is the best proxy for the</p> <p>24 relevant probability in this case for which data is</p> <p>25 available?</p>	<p style="text-align: right;">Page 97</p> <p>1 arson." And I cite that simply by way of example.</p> <p>2 Like, again, I'm happy to read through this</p> <p>3 entire section and make sure I've identified all the</p> <p>4 different places where I identify the source documents</p> <p>5 and the conclusions I draw from those document.</p> <p>6 Q I'm not going to cheat you, and if you don't</p> <p>7 testify to it, try to say that it's not -- if it's in</p> <p>8 here, it's in here. I promise.</p> <p>9 Is it, is it your view that the probability</p> <p>10 of detection for price-fixing cartels is a useful</p> <p>11 proxy for estimating the probability of detection</p> <p>12 relevant to this case?</p> <p>13 A I believe it is reasonable to use as one of</p> <p>14 the data points in establishing a range of</p> <p>15 probabilities. I think that there are ways in which</p> <p>16 that probability may actually overestimate the</p> <p>17 probability of detection of a case -- of a -- of</p> <p>18 conduct such as this. So I think there's probably</p> <p>19 less, a low -- there may be a lower probability of</p> <p>20 detecting deception and the type, specific type of</p> <p>21 conduct here, and I believe I describe the, the</p> <p>22 impact, for example, of the leniency program in</p> <p>23 price-fixing cartels, where there are, there are</p> <p>24 mechanisms that incentivize basically one participant</p> <p>25 and a price-fixing cartel to inform on its other</p>

25 (Pages 94 - 97)

<p style="text-align: right;">Page 98</p> <p>1 members in return for leniency, and there's no  2 comparable program in place that I know of related to  3 the deceptive conduct at issue, and single conduct,  4 single-firm conduct I think is also different than  5 multi-firm conduct in terms of the probabilities of  6 detection.  7 Q The Bryant and Eckart study estimates the  8 probability of detection for price-fixing cartels in a  9 given year to be between 13 percent and 17 percent,  10 right?  11 MR. COLLIER: Objection; form.  12 THE WITNESS: That is my recollection and  13 consistent with the sentence in my report, yes.  14 BY MR. DAVIS:  15 Q So is that an annual probability?  16 A As I sit here, I don't -- I do not recall.  17 I would need to look back at the study.  18 Q If an annual probability -- actually, let me  19 strike that.  20 Can I start that question over?  21 A You can.  22 Q What you wrote in your report is that the  23 Bryant and Eckart study estimates the probability of  24 detection in a given year to be between 13 percent and  25 17 percent, right?</p>	<p style="text-align: right;">Page 100</p> <p>1 improperly quoted. In particular, in the literature  2 relevant to optimal finds, the authors often refer to  3 a value of 15 percent as average probability of  4 getting caught, as Bryant and Eckart estimated a  5 probability that falls between 13 percent and  6 17 percent, but this 15 percent rate is the annual  7 probability of getting caught."  8 Do you see that?  9 A "The annual probability of getting  10 caught . . . for cartels which will eventually be  11 detected."  12 Q Right.  13 A Yes.  14 Q If I have an annual probability of detection  15 of ten percent and my conduct goes on for two years,  16 what's the probability of detection across a two-year  17 period?  18 A Assuming those are just for the ease of  19 math, I'll just say 20 percent.  20 Q In fairness to you, it's probably  21 19 percent?  22 A I know. That's why I was trying to do the  23 easy math, just for the record.  24 Q Would it surprise you that a ten percent  25 probability over the course of 20 years stacked on top</p>
<p style="text-align: right;">Page 99</p> <p>1 A That's what it says. I'm trying to  2 remember. I think there's different ways in which you  3 can interpret that. I think the -- I, I would just  4 need to review how they came up with that number.  5 Q Understood.  6 We mentioned it earlier, but you also cite  7 the, the Combe study from price-fixing cases in the  8 EU, right?  9 A That's correct.  10 MR. DAVIS: And we'll mark this as Exhibit  11 2.  12 (Exhibit 2 was marked for  13 identification.)  14 BY MR. DAVIS:  15 Q And Exhibit 2 is the Combe study cited in  16 footnote 191 of your report, right?  17 A I believe so. Give me one minute. Yes.  18 Q Can you look, just page 1, the, the second  19 paragraph.  20 And you see that the, the Combe article is  21 discussing the Bryant and Eckart piece, right?  22 A That is correct.  23 Q If you look at the last full sentence, it  24 says, "Their paper became the most quoted work on this  25 issue. Nevertheless, the results were often</p>	<p style="text-align: right;">Page 101</p> <p>1 of each other annually becomes 88 percent?  2 A Mathematically, that's correct. That, that  3 would not surprise me as the result of that, but I  4 thinks that is an incorrect application of the  5 probabilities to the facts of this case, i.e. -- or  6 even the price-fixing cases. I don't think that there  7 is an 88 percent chance of every cartel that's formed  8 of being detected on an ex ante basis at the moment of  9 inception.  10 Q You're aware that Bryant and Eckart study  11 finds that the absence of detection in one year does  12 not materially affect the probability of detection the  13 next year, aren't you?  14 MR. COLLIER: Objection; form.  15 THE WITNESS: If you could point me to where  16 they say that.  17 BY MR. DAVIS:  18 Q I'm just asking: Are you aware of that?  19 A I'm, I'm not -- I just don't recall them  20 specifically stating that. I -- it's not a surprising  21 assumption to me.  22 Q Did you --  23 A Could you give me a second to think about  24 it?  25 Again, it's -- if they said it, they said</p>



<p style="text-align: right;">Page 102</p> <p>1 it. I'm not quibbling with what, what the article 2 does or does not say. I think I just need to think 3 about the way in which one might draw reasonable 4 inferences from that fact in applying and deriving an 5 ex ante probability of detection and enforcement and 6 collection of a penalty. 7 Q Does your report make the mistake that this 8 Combe study is noting that a lot of people make? 9 MR. COLLIER: Objection; form. 10 THE WITNESS: Am I making a mistake? No, I 11 don't believe my report is making a mistake. I 12 think the -- I have described in my report the 13 full scope of information that I consider, and I, 14 I provide a range that I think is reasonable for 15 the jury to consider, and I certainly consider 16 33 percent to be at the upper end of what I would 17 consider a reasonable range. I have a lower 18 bound of ten percent, and I think I describe 19 elsewhere in the report where I consider 20 20 percent to be a reasonable median estimate. 21 I'm not relying entirely on this one study that 22 they are citing. 23 BY MR. DAVIS: 24 Q Until we talked about it just now, you did 25 not understand that the Bryant and Eckart probability</p>	<p style="text-align: right;">Page 104</p> <p>1 (Exhibit 3 was marked for 2 identification.) 3 BY MR. DAVIS: 4 Q And I'll tell you, Professor DeRamus, this 5 is from your new set of backups, so this has adjusted 6 numbers, not the -- well, you'll see. 7 A Okay. Sorry. You said this is from my new 8 set of backup materials? 9 Q Correct. 10 A Okay. 11 Q And then I'm also going to hand you what 12 we'll mark as Exhibit 4, which is another worksheet 13 from the new set. 14 A Okay. 15 Q I think these are the two that we're going 16 to talk about, but . . . 17 (Exhibit 4 was marked for 18 identification.) 19 BY MR. DAVIS: 20 Q So it looks to me like Exhibit 3 is the 21 backup for the ex post calculation, and Exhibit 4 is 22 the backup for the ex ante calculation, and I won't 23 hold you to it if there's more backup elsewhere. I 24 just want to frame this. 25 A Could you give me one minute? And the only</p>
<p style="text-align: right;">Page 103</p> <p>1 is per year, true? 2 A Well -- 3 MR. COLLIER: Objection; form. 4 THE WITNESS: In my analysis, I did consider 5 this question of probabilities associated with 6 multi-year conduct. I did consider the fact that 7 it is the conduct here. Ongoing conduct may be 8 different than one-time conduct, and I concluded 9 that the numbers I provided, the range I provided 10 were reasonable to apply with regard to ongoing 11 conduct. 12 BY MR. DAVIS: 13 Q You do agree that what Professor Combe is 14 saying here is that folks have made the mistake of 15 citing Bryant and Eckart as a roughly 15 percent 16 probability of detection without accounting for the 17 fact that it's annual; isn't that true? 18 A I will agree that they -- what the sentence 19 says. I would need to see further about the, the 20 actual content of the article, as well as I would need 21 to go back -- 22 Q Understood. 23 A -- and review the, the original article. 24 MR. DAVIS: The next one we're going to mark 25 is Exhibit 3.</p>	<p style="text-align: right;">Page 105</p> <p>1 reason I'm, I'm hesitating a little bit is because it 2 is the ex post calculation, but the ex post 3 calculations do not change from the original ones. It 4 was the ex ante -- 5 Q I don't know if these numbers actually 6 change. I just mean this is my new, my new Excel 7 spreadsheet. 8 A Yes. I'm sorry. Maybe I was assuming too 9 much about your -- what, what your question was going 10 to be. 11 But yes, this shows the ex post calculation 12 in Exhibit 3. And just give me one second. And it 13 shows a further calculation of that amount with the 14 allocation to certain plaintiff states at the back, 15 and then Exhibit 4 is the 20-year term calculation. 16 Q Gotcha. 17 And I mostly just want to make sure we're on 18 the same page about the starting numbers. I don't 19 understand some of the weeds and won't get into them, 20 because I'll sound foolish if I try. 21 For the, for the RPO penalty analysis, you 22 start from what you say to be Google's expectation of 23 [REDACTED] in incremental revenue per year from RPO, 24 correct? 25 A Correct.</p>

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1 Q And you apply Google's DVAA wide profit  
2 margin to [REDACTED]  
3 [REDACTED], right?  
4 A I, again, I would direct you to the  
5 explanation in my report. It's the gross profit  
6 margin.  
7 Q I'm not trying to trick you. I promise.  
8 A I know, but I just want the, the -- I want  
9 the record to be clear in terms of what measure of  
10 profit, because it will make a difference.  
11 Q So it's basically accounting for revenue  
12 shares as between Google and its customers, as opposed  
13 to also accounting for operating costs and overhead,  
14 fair?  
15 A It would account for the incremental profits  
16 that Google likely earned as a result of the program,  
17 which would not include fixed costs that might not --  
18 that would not have increased as a result of the  
19 conduct.  
20 Q The -- for RPO specifically, [REDACTED]  
21 [REDACTED] profit, that's the starting point, that's the  
22 amount of additional profit that you say Google  
23 expected to earn as compared to a world where it  
24 didn't do RPO, right?  
25 A Yes, but give me one minute to find the

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1 [REDACTED], because these are revenues. Oh,  
2 here. There are just different data inputs for some  
3 of the calculations, and I know I'm using DVAA gross  
4 profit margin for RPO and DRS, and for Bernanke, I had  
5 a -- I have two different versions, one using that  
6 gross profit margin and one using the explicit  
7 estimate from the AB testing the company had done,  
8 but -- I'm sorry -- it looks like you were pointing to  
9 a particular cell in my report.  
10 Q The bottom of Exhibit 4 reflects that  
11 [REDACTED]  
12 [REDACTED], right?  
13 [REDACTED]  
14 [REDACTED].  
15 Q Okay.  
16 A The bottom -- yes. I was looking at the  
17 bottom right. The bottom left, just so the record is  
18 clear, [REDACTED]  
19 [REDACTED]  
20 Q And that [REDACTED]  
21 incremental profit that you believe Google expected to  
22 earn as a result of running RPO as compared to not  
23 running RPO, right?  
24 MR. COLLIER: Objection; form.  
25

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1 THE WITNESS: Correct. I would probably  
2 change a little bit of your wording, but I think  
3 yes, in general terms, I think you are right,  
4 that it is an incremental profit that I believe  
5 they would have reasonably expected to earn as of  
6 the start of the -- of that particular conduct.  
7 BY MR. DAVIS:  
8 Q As a result of that conduct, right?  
9 A Correct, as a result of that conduct.  
10 Q You start with the same figures for DRS,  
11 right, namely, [REDACTED]  
12 [REDACTED]?  
13 A That's correct, but just give me a second to  
14 look at the spreadsheet. Yes.  
15 Q Okay, and with respect to Bernanke,  
16 recognizing that you've applied two different profit  
17 margins to allow the jury a couple of different  
18 options, you start in both cases with [REDACTED]  
19 [REDACTED], right?  
20 A In the ex ante approach, yes.  
21 MR. COLLIER: Objection.  
22 Well, go ahead.  
23 BY MR. DAVIS:  
24 Q Do you use a different number in the ex post  
25 approach?

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1 A I believe in the ex post approach, I -- give  
2 me one minute. I believe I cut that in half in the ex  
3 post approach.  
4 Q For the year 2014?  
5 A Correct, Bernanke year 2014.  
6 Q So just so it's clean for the record, in the  
7 ex ante approach, [REDACTED]  
8 incremental Bernanke revenue starting in 2014, right?  
9 MR. COLLIER: Objection; form.  
10 THE WITNESS: Correct.  
11 BY MR. DAVIS:  
12 Q And in the ex post approach, you attribute  
13 half that amount to 2014, right?  
14 A Correct.  
15 Q How come?  
16 A I felt the, the ex post approach, it was  
17 just a more, a more conservative assumption to looking  
18 at it on a retrospective basis to assume that there  
19 may have been a ramp-up time period associated with  
20 that program.  
21 There was not a -- I'm piecing together  
22 different documents and different studies that have  
23 different numbers associated with them, so I felt that  
24 was -- in terms of coming to a number of, of -- or an  
25 ex post number that is not going to overestimate the,



<p style="text-align: right;">Page 110</p> <p>1 the actual revenues and actual profits, I felt that</p> <p>2 was a reasonable assumption to make.</p> <p>3 The ex ante is a different framework,</p> <p>4 because it really is from the framework of, as a --</p> <p>5 again, I'll call -- I will say the wrongdoer, but I'm</p> <p>6 putting it within the context of this deterrent</p> <p>7 penalty approach.</p> <p>8 From a wrongdoer's perspective, the question</p> <p>9 is what is the -- what were their reasonable</p> <p>10 expectations about the benefits that they were going</p> <p>11 to obtain from their wrongdoing, and that, based on</p> <p>12 the data available to me and some of the preliminary</p> <p>13 studies that they had done and the more extensive</p> <p>14 studies that they had done later on, I concluded</p> <p>15 that -- because I'm assuming that Bernanke is</p> <p>16 effectively one course of conduct, and even though</p> <p>17 there are multiple Bernanke programs associated with</p> <p>18 it, I assumed that it would be a reasonable approach</p> <p>19 from the ex ante perspective to start with a</p> <p>20 [REDACTED] as the expectation of the annual revenue</p> <p>21 or the incremental annual revenue that the company</p> <p>22 could earn from that particular course of conduct, and</p> <p>23 then apply that into the future.</p> <p>24 Q Bernanke did nowhere near [REDACTED] of</p> <p>25 incremental revenue in 2014, did it?</p>	<p style="text-align: right;">Page 112</p> <p>1 A Sure.</p> <p>2 Q Do you see the top of Exhibit 3, you have a</p> <p>3 line item for Bernanke in that table at the top?</p> <p>4 A Yes, I do.</p> <p>5 Q Do you see a source date?</p> <p>6 A Yes.</p> <p>7 Q And it says August 17, 2015, right?</p> <p>8 A Correct.</p> <p>9 Q And that's where that [REDACTED] revenue</p> <p>10 figure comes from?</p> <p>11 A That's my recollection. I'm trying to</p> <p>12 remember if the, if the study was conducted on 8/17 or</p> <p>13 whether it was a -- but I believe that's correct.</p> <p>14 Yes, 2015. I'm sorry. Now I remember.</p> <p>15 Q Can you describe at a high level the degree</p> <p>16 to which you understand the differences between what</p> <p>17 was called "Bernanke," and then on the other hand,</p> <p>18 "Global Bernanke."</p> <p>19 A I can point you to my report for a more</p> <p>20 complete description, but it was -- there was a --</p> <p>21 generally a more -- well, I probably prefer to point</p> <p>22 to my report for that distinction. It was an</p> <p>23 expansion of the, of the scope of the program.</p> <p>24 Q Got it.</p> <p>25 Assume for me that Global Bernanke was</p>
<p style="text-align: right;">Page 111</p> <p>1 MR. COLLIER: Objection; form.</p> <p>2 THE WITNESS: I have not seen any documents</p> <p>3 stating that, showing that as a factual matter.</p> <p>4 BY MR. DAVIS:</p> <p>5 Q Have you seen any documents showing that the</p> <p>6 actual incremental revenue from Bernanke in 2014 were</p> <p>7 anywhere near [REDACTED]?</p> <p>8 A Well, the [REDACTED] incremental</p> <p>9 revenue -- make sure I'm quoting you back the right</p> <p>10 number -- was derived from a -- I'm sorry. Give me</p> <p>11 one minute just to make sure it's -- I -- there's [REDACTED]</p> <p>12 [REDACTED]. I just want to make sure I'm citing the right</p> <p>13 number.</p> <p>14 Where is the revenue number?</p> <p>15 MR. COLLIER: Dr. DeRamus, so counsel has a</p> <p>16 clear record, you're going between two</p> <p>17 spreadsheets. If you would just make clear if</p> <p>18 you refer to Exhibit 3 versus Exhibit 4.</p> <p>19 THE WITNESS: Correct.</p> <p>20 So Exhibit 3, you will see the ex post</p> <p>21 assumptions for -- I'm sorry. Give me a moment</p> <p>22 to orient myself.</p> <p>23 BY MR. DAVIS:</p> <p>24 Q I, I can help, if you like. Just let me</p> <p>25 know.</p>	<p style="text-align: right;">Page 113</p> <p>1 launched in 2015.</p> <p>2 It wouldn't be appropriate to use expected</p> <p>3 revenue from Global Bernanke in determining Google's</p> <p>4 expected revenue in 2013 when it launched original</p> <p>5 Bernanke, would it?</p> <p>6 A Well, that's why I use a different</p> <p>7 perspective for my ex post versus my ex ante analysis.</p> <p>8 So for the ex post analysis, we know that there was a</p> <p>9 phased rollout of the program, that there was one</p> <p>10 version followed by another version, followed by a</p> <p>11 subsequent version, just like there was on DRS. So in</p> <p>12 the ex post analysis, I, I account for that.</p> <p>13 In the ex ante analysis, this is really a,</p> <p>14 kind of a longer term perspective, so what is the</p> <p>15 available that they would have had -- information --</p> <p>16 what is the information that would have been available</p> <p>17 to Google to make that decision, what would have been</p> <p>18 a reasonable expectation, and here, we are -- there</p> <p>19 are different ways of implementing the calculations,</p> <p>20 and I'm assuming a one-shot deal for Bernanke as</p> <p>21 opposed to I could have layered on additional versions</p> <p>22 and -- of, of Bernanke and calculated incremental</p> <p>23 impact of the different versions of it, and here I</p> <p>24 chose to simply use a single [REDACTED] incremental</p> <p>25 revenue assumption for the entirety of the program,</p>

<p style="text-align: right;">Page 114</p> <p>1 from the ex ante perspective.</p> <p>2 Q What does ex ante mean?</p> <p>3 A Oh, I'm sorry. It's the, the perspective</p> <p>4 of -- at the initiation of the conduct, if I'm trying</p> <p>5 to assess a deterrent penalty amount or to try and</p> <p>6 assess what is the dollar magnitude of a penalty that</p> <p>7 would be required to deter someone from doing that</p> <p>8 conduct at the -- at that point in time.</p> <p>9 Q When did RPO start, according to your</p> <p>10 Exhibit 4 at the top?</p> <p>11 A RPO started in March of 2015.</p> <p>12 Q And so if we want evidence of Google's ex</p> <p>13 ante expectation, as you just explained it to me, we</p> <p>14 should look for evidence on or before March 31, 2015,</p> <p>15 correct?</p> <p>16 MR. COLLIER: Objection; form.</p> <p>17 THE WITNESS: Well, I think if you have -- I</p> <p>18 would look at all the information that's</p> <p>19 available, both the information that's available</p> <p>20 at that date. Unfortunately, we deal in a world</p> <p>21 where we don't have perfect information. I can't</p> <p>22 recreate what was, what was in the minds of the</p> <p>23 individual Google employees who were engaged in</p> <p>24 this process.</p> <p>25 So I would use -- I have used documents and</p>	<p style="text-align: right;">Page 116</p> <p>1 benefits associated with a, each incremental</p> <p>2 improvement of a particular program, then ideally</p> <p>3 I would have ex ante estimates of each of those</p> <p>4 incremental improvements, and then I could do the</p> <p>5 net present value calculation of adding up these</p> <p>6 incremental improvements on a step-by-step basis.</p> <p>7 If I'm doing it effectively as a one-shot</p> <p>8 deal to say what is the reasonable expectation of</p> <p>9 the expected future benefits of the entirety of</p> <p>10 the program in all of its iterations, then I'm</p> <p>11 trying to rely on what I think is the most</p> <p>12 reliable document for that, that calculation.</p> <p>13 But I have seen other documents with other</p> <p>14 numbers, and I think -- and they are informative</p> <p>15 of my opinions, and I think you might be able to</p> <p>16 combine them in different ways in different</p> <p>17 iterations that would also be reasonable.</p> <p>18 MR. COLLIER: Counsel, I'm sorry. We've got</p> <p>19 lunch --</p> <p>20 MR. DAVIS: Almost done.</p> <p>21 MR. COLLIER: Well, I just wanted to tell</p> <p>22 you lunch is here. We've been going an hour,</p> <p>23 but --</p> <p>24 MR. DAVIS: Yeah, yeah.</p> <p>25 MR. COLLIER: Well, I just wanted to tell</p>
<p style="text-align: right;">Page 115</p> <p>1 studies from around the time that these programs</p> <p>2 were implemented, some of them are, by nature,</p> <p>3 were done after the beginning of the</p> <p>4 implementation where they are assessing the</p> <p>5 effectiveness of those particular programs.</p> <p>6 BY MR. DAVIS:</p> <p>7 Q Did you review the documents reflecting</p> <p>8 experiments and expectations from on or before the</p> <p>9 start date of RPO?</p> <p>10 A I've reviewed a number of different studies.</p> <p>11 I just don't recall when all of those experiments were</p> <p>12 conducted. I do recall reading some, and reviewing</p> <p>13 some experiments from Bernanke from the earlier time</p> <p>14 period, from early in -- I believe it was 2013, and --</p> <p>15 but I just don't recall for RPO specifically.</p> <p>16 Q If there were a document reflecting Google's</p> <p>17 experiments or expectations from on or before</p> <p>18 March 31, 2015 with respect to RPO, that would be</p> <p>19 better evidence of Google's ex ante expectation with</p> <p>20 respect to RPO, true?</p> <p>21 MR. COLLIER: Objection; form.</p> <p>22 THE WITNESS: It might or might not. It</p> <p>23 would depend on, again, the way you set up the,</p> <p>24 the benefits model.</p> <p>25 So if I were to separately estimate the, the</p>	<p style="text-align: right;">Page 117</p> <p>1 you lunch is here. We've been going an hour, but</p> <p>2 finish off your section. I'm not trying to</p> <p>3 interrupt. I just wanted to --</p> <p>4 MR. DAVIS: You're cool. I gotcha. You're</p> <p>5 from Texas. I know you're not getting in the</p> <p>6 way. People are nice in Texas.</p> <p>7 MR. COLLIER: I would never get in the way</p> <p>8 of lunch either.</p> <p>9 MR. DAVIS: That goes without saying. Me</p> <p>10 neither.</p> <p>11 MR. COLLIER: That's probably evident from</p> <p>12 my waistline. Go ahead.</p> <p>13 BY MR. DAVIS:</p> <p>14 Q If we want to do an actual ex ante</p> <p>15 calculation, we need to determine what Google expected</p> <p>16 to derive from a given conduct before it decided to</p> <p>17 implement that conduct, true?</p> <p>18 A We need to derive an estimate of the</p> <p>19 expected value of that, of that conduct over the</p> <p>20 entire course of that conduct, but using reasonable</p> <p>21 proxies, given the data that we have.</p> <p>22 And particularly here, the challenge -- the,</p> <p>23 the calculation is -- requires more of a holistic</p> <p>24 consideration of the, of the conduct, because it's not</p> <p>25 simply one course of conduct. It is a program that</p>

<p style="text-align: right;">Page 118</p> <p>1 evolves, and there are other programs that are  2 implemented on top of those programs.  3 So there are greater complexities in this  4 case as opposed to an example of where it was simply a  5 thief thinking about what their expected course --  6 their expected benefits were of a particular robbery,  7 for example.  8 Q But if we want to know the expected benefit  9 to Google from implementing Bernanke, when it made the  10 decision to do so, and when the plaintiffs allege that  11 Google made the decision not to disclose it, that was  12 in November of 2013, wasn't it?  13 A Well, that was at inception of the  14 conduct --  15 Q Yes.  16 A -- but there was an ongoing course of  17 conduct that I considered in my analysis, that Global  18 Bernanke was a different iteration of that particular  19 conduct, of that particular conduct, expanded the  20 benefits associated with that conduct.  21 There was an application of it to other,  22 other products, so there is a need to consider the sum  23 total of that information, as well as the reliability  24 of the individual data points, because I think there  25 are some of those experiments that are done in</p>	<p style="text-align: right;">Page 120</p> <p>1 from an email.  2 Q Did, did you compare -- backing up, it  3 wouldn't be appropriate or reliable to just pull a  4 number out of a random document, would it?  5 MR. COLLIER: Objection; form.  6 THE WITNESS: I would never simply pull a  7 number from a random document and use it in a way  8 that I did not think was appropriate. I do think  9 that there are ways in which in a -- in trying to  10 ascertain and derive an estimate of penalties,  11 particularly in this case, deterrent penalties, I  12 think it is reasonable to consider all the data  13 points, including some of those data points that  14 will appear in various documents; in emails, for  15 example. Those are relevant data points. I  16 wouldn't throw them out.  17 BY MR. DAVIS:  18 Q When did you decide to throw away certain  19 data points on Google's expected revenue from given  20 conduct?  21 (Reporter clarification.)  22 BY MR. DAVIS:  23 Q I should ask: I begged the case there,  24 didn't I?  25 Did you decide to throw away or disregard</p>
<p style="text-align: right;">Page 119</p> <p>1 different time periods that you would also need to  2 assess the, the -- those experiments as well.  3 Q And so when you relied on an experiment, you  4 individually assessed the reliability of the  5 experiment, right?  6 MR. COLLIER: Objection; form.  7 THE WITNESS: I did for the purposes that  8 I'm using them, yes.  9 BY MR. DAVIS:  10 Q How did you do that?  11 A I looked to see whether there were  12 consistency between that particular experiment and  13 other experiments. I looked for references by other  14 Google employees, the results of that, and whether, in  15 effect, there was a passing the news up the chain to  16 indicate that the experiment was providing reliable  17 results to inform decision-makers about the success of  18 the program.  19 I looked at, in some cases, the  20 qualifications of the individuals who performed a  21 particular experiment. I looked at the, the data  22 output, which is contained in some of these -- or the  23 summary of the data output from these experiments, and  24 so I would say that the totality of information is  25 what I, what I did. I didn't simply pull a number</p>	<p style="text-align: right;">Page 121</p> <p>1 any data points that you encountered regarding  2 Google's expected benefits from a given program?  3 A No, I did not.  4 Q So you accounted for every single indication  5 of Google's expected revenue or profit from each of  6 Bernanke, DRS or RPO that you saw, right?  7 A I considered all of them. I considered all  8 of the data points that were available to me in my  9 analysis, yes.  10 Q And disregarded none them as unreliable,  11 right?  12 A I don't believe so. Not as I sit here  13 today. I can't recall when I would say this is a, for  14 lack of a better term, a garbage data point.  15 Q And how do you get the set of documents that  16 you rely on for Google's ex ante expected revenue from  17 a given program?  18 MR. COLLIER: Objection; form.  19 THE WITNESS: I directed my staff to do a  20 search of the documents. Some of these documents  21 have been previously cited in other expert  22 reports, and that I directed my staff to do a  23 comprehensive search of the data that we had  24 available to us to try and identify all such data  25 points.</p>

<p style="text-align: right;">Page 122</p> <p>1 BY MR. DAVIS:</p> <p>2 Q Were any of them identified by the</p> <p>3 plaintiffs' lawyers for you?</p> <p>4 MR. COLLIER: I'm going to object, and</p> <p>5 counsel, you're violating the stipulation about</p> <p>6 communications between counsel and the testifying</p> <p>7 witness.</p> <p>8 MR. DAVIS: Literally Rule 26, facts given</p> <p>9 to the expert. You can look it up.</p> <p>10 MR. COLLIER: I object -- give me a moment.</p> <p>11 MR. DAVIS: Let's do this. Let's break for</p> <p>12 lunch. Can we go off?</p> <p>13 MR. COLLIER: Yeah, we can go off.</p> <p>14 MR. DAVIS: Because I don't want to bicker</p> <p>15 about it. If you want --</p> <p>16 MR. COLLIER: I don't want to bicker about</p> <p>17 it.</p> <p>18 MR. DAVIS: I don't want to -- I at least</p> <p>19 don't want to bicker about it on the record.</p> <p>20 Because I will occasionally say something dumb.</p> <p>21 THE VIDEOGRAPHER: The time is 12:02 p.m.</p> <p>22 This ends unit 2. We're off the record.</p> <p>23 (Whereupon, a short recess was taken.)</p> <p>24 THE VIDEOGRAPHER: The time is 12:57 p.m.</p> <p>25 This begins unit number 3. We're on the record.</p>	<p style="text-align: right;">Page 124</p> <p>1 that the page ending 895 with a slide titled "Bernanke</p> <p>2 Success"?</p> <p>3 A Correct.</p> <p>4 Q And then there's a, a screenshot from an</p> <p>5 experiment in Rasta, R-A-S-T-A, right?</p> <p>6 A Correct.</p> <p>7 Q What, if anything, did you do to confirm</p> <p>8 that the [REDACTED] figure was a reasonable</p> <p>9 expectation, reasonably accurate?</p> <p>10 A I considered the way in which the experiment</p> <p>11 was run, the fact that this is an AB experiment, as it</p> <p>12 were; i.e., it's being run on a population that</p> <p>13 includes transactions where Bernanke is on versus</p> <p>14 those where Bernanke is off.</p> <p>15 I reviewed the output on the spreadsheet. I</p> <p>16 looked for other documents and compared these results</p> <p>17 with other documents, other documents that I reviewed.</p> <p>18 I reviewed some of the deposition testimony about this</p> <p>19 document as well. I believe it was about this</p> <p>20 document. It may have been about Rasta in general or</p> <p>21 about other experiments.</p> <p>22 Q And is the [REDACTED] from</p> <p>23 Bernanke figure consistent with the other documents</p> <p>24 you reviewed?</p> <p>25 A I believe it was generally, particularly in</p>
<p style="text-align: right;">Page 123</p> <p>1 BY MR. DAVIS:</p> <p>2 Q Dr. DeRamus, looking at Exhibit 3 at the</p> <p>3 top, can you confirm for me that the document you cite</p> <p>4 for Google's expected revenue from Bernanke ends in</p> <p>5 the Bates number 28385887?</p> <p>6 A Correct.</p> <p>7 Q And the page reference is the page ending</p> <p>8 895, right?</p> <p>9 A Correct.</p> <p>10 Q And that's the one you believe to reflect</p> <p>11 [REDACTED] a year of expected revenue to Google from</p> <p>12 Bernanke, correct?</p> <p>13 A Correct.</p> <p>14 (Exhibit 5 was marked for</p> <p>15 identification.)</p> <p>16 BY MR. DAVIS:</p> <p>17 Q I'm going to hand you what we've marked as</p> <p>18 Exhibit 5.</p> <p>19 The first question is very hard. Is this</p> <p>20 the document that you cite for [REDACTED]</p> <p>21 [REDACTED] expectation?</p> <p>22 A That's the right Bates number. Let me just</p> <p>23 double-check the, the specific page.</p> <p>24 Correct.</p> <p>25 Q And when you say "the specific page," is</p>	<p style="text-align: right;">Page 125</p> <p>1 terms of the ultimate dollar profit that we're using.</p> <p>2 So there's some inferences I needed to make in</p> <p>3 comparing it with other documents, because some of the</p> <p>4 other experiments were run at different time periods</p> <p>5 and different versions of Bernanke, and they may have</p> <p>6 had different results associated with it, but I did</p> <p>7 take all that into conversation in relying upon this</p> <p>8 particular document.</p> <p>9 Q When it says [REDACTED] per-year revenue</p> <p>10 for GDN," do you know what "GDN" is?</p> <p>11 A Yes.</p> <p>12 Q What is it?</p> <p>13 A The Google Display Network.</p> <p>14 Q And is that a synonym for Google, Inc. or a</p> <p>15 division of Google -- excuse me -- Google, LLC?</p> <p>16 Can I start the question again, please?</p> <p>17 A Yes.</p> <p>18 Q Is GDN, in your understanding, Google in its</p> <p>19 entirety or a division of Google?</p> <p>20 A Neither.</p> <p>21 Q What is GDN?</p> <p>22 A It's a reference to a, what is effectively a</p> <p>23 product offering. There's different ways in which</p> <p>24 it's described in different documents, but in effect,</p> <p>25 it is the, I believe the ad -- an ad buying tool, but</p>

<p style="text-align: right;">Page 126</p> <p>1 it reflects -- the Display Network is the broader</p> <p>2 network into which those, uh, advertisers are being</p> <p>3 sold impressions.</p> <p>4 Q As used on the, the slide we're looking at</p> <p>5 and that you relied on, "GDN" is a synonym for what's</p> <p>6 now called Google Ads, right?</p> <p>7 A I would say correct with an asterisk. I</p> <p>8 would probably refer you to -- Dr. Chandler talked</p> <p>9 about the GDN, and I just don't recall specifically in</p> <p>10 terms of the -- there's been a number of different</p> <p>11 acronyms over time, and it sounded -- in some of the</p> <p>12 documents, the GDN might be a little bit more of an</p> <p>13 elastic concept versus Google Ads --</p> <p>14 THE REPORTER: Slow down. "Might be more of</p> <p>15 an" --</p> <p>16 THE WITNESS: Elastic concept versus Google</p> <p>17 Ads, which is a very specific product.</p> <p>18 MR. COLLIER: Sorry. Slow down -- just your</p> <p>19 hourly reminder, slow down for the court</p> <p>20 reporter.</p> <p>21 BY MR. DAVIS:</p> <p>22 Q Whatever "GDN" stands for in this slide,</p> <p>23 that is the entity to which the [REDACTED]</p> <p>24 revenue expectation applies, right?</p> <p>25 A The product or the group of products is</p>	<p style="text-align: right;">Page 128</p> <p>1 Q That were not Google Ads.</p> <p>2 MR. COLLIER: Objection; form.</p> <p>3 THE WITNESS: Well, to be clear, we're</p> <p>4 talking about an ad tech product. So Google</p> <p>5 sells ad, an ad-buying tool, and so there are</p> <p>6 other users of competing ad-buying tools, and</p> <p>7 they are not winning the auctions -- or they are</p> <p>8 winning fewer auctions as a result of the</p> <p>9 implementation of Bernanke.</p> <p>10 BY MR. DAVIS:</p> <p>11 Q In the relevant time period, did Google</p> <p>12 offer one or more ad-buying tools?</p> <p>13 A It offered at least two, probably three if</p> <p>14 you include -- well, I'll just say at least two.</p> <p>15 Q While Bernanke increased the win rate of</p> <p>16 Google Ads advertisers on AdX, it also decreased the</p> <p>17 win rate of non-Google advertisers on AdX, correct?</p> <p>18 A Maybe just to speed up the answer, I will --</p> <p>19 well, it's just that "non-Google advertisers" is a bit</p> <p>20 of a loaded term. I would just say it decreases the</p> <p>21 win rate of other advertisers using non-Google ad tech</p> <p>22 products.</p> <p>23 Q And that would result in an offset,</p> <p>24 offsetting loss of revenue to Google, right?</p> <p>25 MR. COLLIER: Objection; form.</p>
<p style="text-align: right;">Page 127</p> <p>1 probably how I would describe it, yes.</p> <p>2 Q Okay, and so because you analyzed this</p> <p>3 experiment and assured yourself of its reliability,</p> <p>4 you know which divisions of Google that revenue was</p> <p>5 accruing to, right?</p> <p>6 A Well, the short answer is I understand it's</p> <p>7 part of their ad tech business, so it's rolling up</p> <p>8 into their DVAA financials. I just don't recall the</p> <p>9 divisional structure of Google, or alphabetic at this</p> <p>10 point.</p> <p>11 Q Bernanke affected the revenue of Google</p> <p>12 tools or divisions other than GDN, too, right?</p> <p>13 A Correct. It likely had an impact. It</p> <p>14 likely affected the broader range of Google's ad tech</p> <p>15 ecosystem.</p> <p>16 Q So, for instance, one thing that Bernanke</p> <p>17 caused to happen is that Google Ads advertisers had a</p> <p>18 higher win rate on AdX, right?</p> <p>19 A Correct.</p> <p>20 Q The inverse of that is that non-Google Ads</p> <p>21 advertisers had lower win rates, as a result of</p> <p>22 Bernanke, on AdX, right?</p> <p>23 A By "non-Google advertisers," I assume you</p> <p>24 mean advertisers using ad-buying tools that were not</p> <p>25 Google's ad-buying tools, correct?</p>	<p style="text-align: right;">Page 129</p> <p>1 THE WITNESS: Well, the immediate impact is</p> <p>2 going to -- if they're using other competing ad</p> <p>3 tech products, it's going to be a decline in</p> <p>4 revenue for sellers of other ad tech products,</p> <p>5 but it would reduce a -- I'd have to think</p> <p>6 through the implications of the revenues on</p> <p>7 the -- on AdX itself.</p> <p>8 BY MR. DAVIS:</p> <p>9 Q If without Bernanke, an impression is won by</p> <p>10 a third-party authorized buyer on AdX, but with</p> <p>11 Bernanke, it is won by a Google Ads advertiser. There</p> <p>12 is both a positive revenue impact to Google from the</p> <p>13 Google Ads advertiser, and a negative revenue impact</p> <p>14 from losing the revenue share at the AdX level from</p> <p>15 that authorized buyer; isn't that true?</p> <p>16 A Correct. That's my understanding also of</p> <p>17 the data that's produced in this document.</p> <p>18 Q Have you actually looked at the data that's</p> <p>19 in the screenshot?</p> <p>20 A I have, yes.</p> <p>21 Q What does it say Google's overall profit</p> <p>22 increase as a result of Bernanke was?</p> <p>23 A So the -- there's a "Total" line at the very</p> <p>24 top, and it shows the profit increase of, as I, as I</p> <p>25 interpret as I sit here today, [REDACTED] for the</p>

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1 increase in Google profit.  
2 Q And it's post rev share payout increased by  
3 how much?  
4 A Well, in percentage terms -- actually, I'm  
5 sorry. I need my reading glasses. I believe it's  
6 [REDACTED].  
7 Q You're correct.  
8 A Thank you.  
9 Q That's less than [REDACTED], isn't it?  
10 A Well, it's on a different base. I mean the  
11 percentage is different, but the, but the, the dollars  
12 are, are -- is calculating based on a different set of  
13 dollars.  
14 Q The percentage is less than half of the  
15 percentage associated with the [REDACTED]  
16 revenue figure that you use in your calculations,  
17 true?  
18 MR. COLLIER: Objection; form.  
19 THE WITNESS: True, but I don't think those  
20 percentages are comparable.  
21 BY MR. DAVIS:  
22 Q Why do you not think that?  
23 A Because they're calculated as a percentage  
24 of a different number. You'll see, on that row 3,  
25 those percentages, [REDACTED] is calculated as

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1 a difference between the [REDACTED] -- I'm sorry.  
2 Again, I don't -- I need my reading glasses, but it's  
3 calculated based on that smaller number, whereas up  
4 above, line 1 or the first block, is a percentage of  
5 [REDACTED], and now I'm looking at the revenue  
6 number.  
7 Q Right. The [REDACTED] revenue is the  
8 revenue only looking at AdWords buyers on AdX, right?  
9 A Correct.  
10 Q There were more buyers than just AdWords  
11 buyers on AdX, weren't there?  
12 A That's correct.  
13 Q And so when you take a count of the effect  
14 of Bernanke on all buyers, not just AdWords buyers,  
15 the revenue impact is actually [REDACTED], true?  
16 A As a percentage, yes.  
17 Q But you used [REDACTED], right?  
18 A Well --  
19 MR. COLLIER: Objection; form.  
20 THE WITNESS: -- I cite to the [REDACTED],  
21 and that is the, the statistic that is cited in  
22 this document, the headline statistic on the  
23 document, that's what I've -- I believe I've seen  
24 that, that statement elsewhere, but ultimately  
25 the question is? What is a reasonable estimate

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1 of the incremental revenues or profits associated  
2 with -- and long-term revenues or profits  
3 associated with this program.  
4 BY MR. DAVIS:  
5 Q To whom?  
6 A To Google.  
7 Q And Google is more than just GDN, fair?  
8 A That's correct.  
9 Q And here we see that the revenue to GDN is  
10 [REDACTED] increased, whereas the revenue to Google is  
11 [REDACTED] increased, true?  
12 A Correct, but it's on a different base. The  
13 revenue base -- the GDN revenue base is different from  
14 the, the aggregate revenue base. You'll see the  
15 percentages down below.  
16 Q Yeah, and if you want to walk through it,  
17 right, as a result of Bernanke, according to this  
18 experiment, which also reflects [REDACTED] increased  
19 revenue on AdWords buyers, there's also [REDACTED]  
20 [REDACTED] revenue on [REDACTED], right?  
21 A Correct, and I interpret that as actually a  
22 fairly positive thing from the, from the company's  
23 perspective. They want to reduce the share of  
24 transactions on AdX won by non-Google ad tech tool  
25 buyers.

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1 There's plenty of documents that have even  
2 so much as a frowny face associated with the  
3 non-Google ad tech buyers winning auctions on AdX. So  
4 that is -- and as I understand it from the documents,  
5 they consider that a, a positive --  
6 THE REPORTER: Just a minute. I'm sorry.  
7 THE WITNESS: It's not a --  
8 THE REPORTER: "As I consider it from the  
9 documents," or "as I see from the documents" --  
10 THE WITNESS: Google sees the reduction in  
11 the revenues from the non-Google ad tech or  
12 non-GDN buyers, they see that as a positive  
13 development, not a negative development.  
14 BY MR. DAVIS:  
15 Q Dollar for dollar?  
16 MR. COLLIER: Objection; form.  
17 THE WITNESS: Strategically, I believe they  
18 consider it a substantial long-term benefit to  
19 reduce the number of wins of non-Google ad-buying  
20 tool users on the AdX auction.  
21 There is a preference, a strong preference  
22 by the company to have Google's own customers of  
23 its ad-buying tools win those auctions. We see  
24 that in strategy after strategy, program after  
25 program, and there is -- that is considered a



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1 success of the program if it can reduce that  
 2 number that is in the red highlighted row in that  
 3 table.  
 4 BY MR. DAVIS:  
 5 Q What are "[REDACTED]"?  
 6 A I would probably need to review the full  
 7 context of the document to tell you with certainty. I  
 8 expect it's mobile device buyers, but I -- or it may  
 9 refer to AdMob, but at this point I guess I'm, I'm  
 10 guessing, so I would need to look at the specific  
 11 document.  
 12 Q Did Google enjoy the fact that Bernanke  
 13 caused a [REDACTED] revenue decrease for [REDACTED]  
 14 buyers on AdX, in your opinion?  
 15 MR. COLLIER: Objection; form.  
 16 THE WITNESS: As I sit here today, I don't  
 17 think it would have considered those to be a  
 18 benefit. Again, you do need to put that  
 19 percentage in the context of the, the dollars in  
 20 that column, or in that row, rather. That is a  
 21 much smaller dollar amount than in the other  
 22 ones.  
 23 But in any event, in considering the success  
 24 of the program and whether to continue with the  
 25 program or push the program further, I interpret

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1 that document as indicating that there was  
 2 [REDACTED] revenue, and that's the bottom  
 3 line statistic, summary statistic that was used  
 4 in informing the company's decision-making.  
 5 BY MR. DAVIS:  
 6 Q Are you talking about the title, or I guess  
 7 the bullet at the top of the slide?  
 8 A Correct.  
 9 Q Which literally says "[REDACTED]  
 10 [REDACTED] revenue for GDN)"?  
 11 A Correct.  
 12 Q Which is different than Google, right?  
 13 MR. COLLIER: Objection; form.  
 14 THE WITNESS: Correct.  
 15 BY MR. DAVIS:  
 16 Q Do you agree with me that this document  
 17 actually reflects that the overall incremental revenue  
 18 increase to Google resulting from Bernanke was  
 19 [REDACTED] when expressed as a percentage?  
 20 MR. COLLIER: Objection; form.  
 21 THE WITNESS: Well, [REDACTED] as a  
 22 reflection of a higher -- as a, as a function of  
 23 a higher number, so it's not -- you asked the  
 24 question in terms of what was the impact on the  
 25 aggregate revenue. For that, I would look to

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1 that top row that has the, has aggregate numbers  
 2 on there, but I also understand that Google  
 3 considered the loss of revenue from the  
 4 non-Google parties -- I'm sorry. Let me try that  
 5 again.  
 6 From the -- those who otherwise would have  
 7 won on the AdX auction, but who are using  
 8 non-Google ad-buying tools, they considered that  
 9 decrease to be a positive. It's not a, it's not  
 10 a, a netting problem from their perspective.  
 11 It's not like, oh, we only need to focus on the  
 12 net. We need to focus -- we are happy that it's  
 13 having this impact. I'm sorry. Here I'm  
 14 paraphrasing, but they see that as a positive  
 15 thing as it drives additional long-term revenue  
 16 to Google, that, over time, those people who are  
 17 losing those auctions who are using non-Google ad  
 18 tech products, those customers are then likely  
 19 switching, increasingly, toward GDN or other  
 20 Google products as a way of ensuring they  
 21 actually can clear in the auction.  
 22 BY MR. DAVIS:  
 23 Q Sitting here right now, under oath, and with  
 24 all seriously respect, you can acknowledge that you're  
 25 coming up with that explanation for using the

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1 [REDACTED] figure on the fly, right?  
 2 MR. COLLIER: Objection; form.  
 3 THE WITNESS: No. Under oath, I considered  
 4 every number in this page. I considered how it  
 5 was used. I considered this, particularly  
 6 this -- the structure of this industry and the  
 7 notion that Google has in strategy after  
 8 strategy, where they are working to exclude -- to  
 9 lower the win rate of the non-Google ad tech  
 10 buying tool customers.  
 11 Their objective is to drive more and more  
 12 transactions to individuals who use Google tools,  
 13 and that, over the long term, is a, is a snowball  
 14 effect, I believe Dr. Rudin describes it as.  
 15 And I also have -- I've looked at the  
 16 alternative of using the aggregate number, and I  
 17 could reduce -- the aggregate number of that  
 18 first line, I've looked at the impact it has on  
 19 my numbers, and I don't think it would have a --  
 20 it, it would have some, would cause some  
 21 reduction of some numbers in certain scenarios,  
 22 but at the end of the day, I would still say that  
 23 it doesn't change my overall opinion about the  
 24 appropriate range of deterrent penalties that  
 25 I've calculated.



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1 BY MR. DAVIS:  
2 Q How do you get to [REDACTED], given that  
3 that was not actually the net benefit to Google?  
4 MR. COLLIER: Objection; form.  
5 BY MR. DAVIS:  
6 Q By which I mean: Where is the calculation  
7 by which you are increasing the benefit to Google to  
8 account for what I assume to be the competitive  
9 benefit of driving traffic to Google buying tools?  
10 A So earlier on, you asked about my  
11 calculations in section 6, and in section 6 I have a  
12 fairly straightforward calculation that takes the  
13 [REDACTED] of revenue, and then I apply a certain  
14 profit margin.  
15 That lower profit margin I think understates  
16 the, the profit from those -- from that particular  
17 strategy. I know that, because even looking at the  
18 document, the incremental profit that was being earned  
19 was higher than that. That's why I have a different  
20 sensitivity. I build it up in my section --  
21 THE REPORTER: Slow down. "So I have a" --  
22 THE WITNESS: Different sensitivity.  
23 THE REPORTER: "I build it up" --  
24 THE WITNESS: I build it up using first the  
25 DVA margin, and then using the actual margins as

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1 reflected in this document.  
2 That all tells me that from a, particularly  
3 the ex ante approach, that I am using the numbers  
4 in an economically reasonable way, and I think  
5 earlier I talked about how periodically I step  
6 out of that framework to try and understand the  
7 conduct in its totality and try to assess whether  
8 this result is leading to an overestimate or an  
9 underestimate of the benefits, and net/net, I  
10 think I have underestimated total benefits to  
11 Google from engaging in the course of conduct at  
12 issue.  
13 BY MR. DAVIS:  
14 Q If we want to measure the incremental  
15 benefit to Google from Bernanke, the number is not  
16 [REDACTED] in revenue, is it?  
17 A I think that provides a reasonable starting  
18 point for assessing the expected long-term benefits,  
19 based on the data we have, and as I say in my report,  
20 there are different sources of data, and that's one of  
21 the reasons I use different sources of data, and I  
22 combine them in different ways to come up with an  
23 aggregate dollar amount.  
24 So I do think there are certainly  
25 alternative ways you can use alternative inputs and

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1 come up with different numbers, but I think the way I  
2 have implemented it in my report is a reasonable way.  
3 Q You will agree with me, won't you, that the  
4 slide we're looking at in Exhibit 5 does not indicate  
5 that the incremental revenue to Google as a result of  
6 Bernanke was [REDACTED] per year, won't you?  
7 MR. COLLIER: Objection; form.  
8 THE WITNESS: I agree that is not what that  
9 slide says. It talks about Google Display  
10 Network.  
11 BY MR. DAVIS:  
12 Q And in your report, you do state that that  
13 slide says that the incremental revenue from Bernanke  
14 was [REDACTED], right?  
15 MR. COLLIER: Objection; form.  
16 BY MR. DAVIS:  
17 Q Just what you say.  
18 A I would need to revenue specifically to my  
19 report, but as we sit here today, I would say that it  
20 is -- the document itself, literally looking at the  
21 words of the document, the headline says "[REDACTED]  
22 [REDACTED]  
23 revenue for GDN."  
24 In my calculations, I believe that is a  
25 reasonable estimate to apply for the expected

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1 long-term benefits to Google for that particular  
2 program, and in part because of the other assumptions  
3 I am applying to that [REDACTED]; namely, that the  
4 profits are measured based on incremental -- I'm  
5 sorry. I'm measuring incremental profits, not  
6 incremental revenues, and I'm using this DVAA average.  
7 And for the -- for my first calculation,  
8 instead of the full -- instead of the margin that  
9 appears on this document and frankly in other  
10 documents, other studies that indicated even a higher  
11 incremental profit percentage resulting from the  
12 incremental revenues.  
13 At the end of the day, that's what I'm most  
14 focused on, is the incremental profits, not the  
15 incremental revenue.  
16 Q This document that we've been looking at  
17 also reflects the incremental profits, doesn't it?  
18 A Yes, it does. I'm sorry. I was giving the  
19 court reporter time to catch up with us.  
20 It reflects the incremental profit that I  
21 use in certain calculations, but in other  
22 calculations, I don't use those incremental profit  
23 numbers. I use a lower profit percentage.  
24 Q Based off of the revenue number that you get  
25 from this slide?

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1 A Correct. I do apply the -- that lower  
2 percentage to the same revenue number.  
3 Q The [REDACTED]?  
4 A That's correct.  
5 Q Will you look at paragraph 115 of your  
6 report, please.  
7 Can you read the last sentence of paragraph  
8 115 out loud for the record.  
9 A Correct. Oh, I'm sorry.  
10 "Meanwhile, the Google internal estimate  
11 (before the start of this litigation) is that in a  
12 single year, the incremental profit that Google earned  
13 as a result of the Bernanke program alone is  
14 [REDACTED]."  
15 Q Is that sentence true?  
16 A I, I believe it to be -- in big picture, it  
17 reflects what is on the document. I would say if you  
18 want to say a net, incremental net profit, net of the  
19 loss in that given year, then you would subtract out  
20 the negative in that particular row that you  
21 identified, so that the net incremental profit would  
22 be less than that, but I would need to go through and  
23 do the calculations.  
24 Q And the net incremental profit is what  
25 should be relevant to the expected gain from the

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1 perspective of the wrongdoer, correct?  
2 MR. COLLIER: Objection; form.  
3 THE WITNESS: The purpose of the exercise  
4 that I'm doing is to analyze the long-term  
5 incremental profits to Google of the conduct, and  
6 this conduct in particular has long-term effects,  
7 a lot of feedback loops. There's a lot of --  
8 it's not simply about a small company in a very  
9 large market where that kind of incrementalism is  
10 easier to deal with.  
11 Here, I think the approach that I've done --  
12 and I verified that [REDACTED] as a  
13 starting point is a reasonable approach, and  
14 considering other assumptions that I use in my  
15 calculations, I believe that's a, a reasonable  
16 basis for that calculation.  
17 I've also looked at other ways of doing that  
18 calculation. I don't think those are -- those  
19 other ways would necessarily change my overall  
20 opinion about what is a reasonable range of  
21 deterrent penalty amounts to apply in this case.  
22 This is really just the first step. This is  
23 just the Bernanke, and then I'm talking through  
24 these additional additions to those programs.  
25

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1 BY MR. DAVIS:  
2 Q Bernanke makes up [REDACTED] the  
3 civil penalties that you calculate at any point in  
4 your range, right?  
5 A That's correct. That's what I'm --  
6 approximately.  
7 Q Could you look at paragraph 16 of your  
8 report, please.  
9 A Paragraph 16?  
10 Q Yes. In the middle of paragraph 16, do you  
11 see a sentence that starts "for example"?  
12 A Give me a minute.  
13 I see that, yes.  
14 Q It says, "For example, in 2015, Google  
15 employees estimated that Project Bernanke allowed the  
16 company to earn [REDACTED] incremental revenues  
17 on an annualized basis."  
18 Did I read that correctly?  
19 A You did.  
20 Q That's referring to the slide in Exhibit 5  
21 that we've been looking at, right?  
22 A That's correct.  
23 Q And that sentence is wrong, right?  
24 A Well --  
25 MR. COLLIER: Objection; form.

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1 THE WITNESS: -- I'm -- I am paraphrasing  
2 the document. If I wanted to put quotes around  
3 it, I could, and I could say that it's [REDACTED]  
4 [REDACTED] per year revenue for GDN.  
5 I consider that to be an important data  
6 point and the headline that the company was using  
7 in drawing the conclusions about the success of  
8 this company. They didn't say, hey, let's talk  
9 about Bernanke success, great news, the end  
10 result is Bernanke is only responsible for  
11 [REDACTED] of total revenue.  
12 They said [REDACTED], and I consider that  
13 to be a relevant data point.  
14 BY MR. DAVIS:  
15 Q Who wrote this presentation, Exhibit 5?  
16 Like what group at Google wrote it?  
17 A I don't recall specifically. I recall  
18 reading the deposition transcript about -- I believe  
19 it was about the specific presentation, but I, as I  
20 sit here today, I don't -- I know it says it's -- it  
21 has [REDACTED] on the front of it. The experiment is  
22 run by the Rasta program, which I did a fair amount of  
23 research to understand the Rasta research.  
24 Q What's [REDACTED]  
25 I can ask a better question. Is [REDACTED] a

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1 buy-side group at Google?

2 A I would need to go back and look through the

3 documents. I wouldn't want to hazard a guess.

4 Q Would it make sense that a buy-side group

5 was focused on buy-side revenue changes?

6 A Generally, yes, but I also wouldn't expect

7 employees to be touting a program that had negative

8 results for the entire company as a whole. They

9 clearly thought -- or I'm sorry. Based on the

10 documents alone, from me as an economist, I interpret

11 those as reflecting a benefit to the company of that

12 amount.

13 Q Just to be clear, this experiment isn't

14 reflecting a negative result to the company as a

15 whole, right?

16 A Correct.

17 Q It's reflecting that a fraction of the

18 marginal revenue to GDN is the marginal revenue to

19 Google as a whole from Bernanke, right?

20 MR. COLLIER: Objection; form.

21 THE WITNESS: I'm sorry. Could you repeat

22 that last part?

23 BY MR. DAVIS:

24 Q This experiment that you relied on in your

25 report reflects that the marginal revenue to GDN

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1 resulting from Bernanke is higher than the marginal

2 revenue that inures to the benefit of the whole

3 company, with the entire company considered at once,

4 true?

5 A Correct, in the kind of short time frame or

6 in a shorter time frame, but again, I think I also

7 referred you to a number of other documents that

8 considered, over the long term, there was a net

9 positive every time there is a reduction in

10 third-party buyers who are winning on AdX, that there

11 is a -- appears to be an objective to increase the win

12 rate at the expense -- the win rate of Google ad tech

13 user buyers and to reduce the win rate of competing

14 buyers, and that is a longer term objective that has

15 longer term benefits for the company.

16 Q And where is that longer term benefit

17 calculated in your report, if anywhere?

18 A I don't explicitly calculate that, and

19 that's one of the reasons why I consider my numbers

20 to, if anything, be on the more cautious side, because

21 they don't fully account for all of the longer term

22 benefits. It is the problem associated with a product

23 that has -- or with integrated products that have

24 these snowball effects.

25 MR. DAVIS: I'll show you what we'll mark as

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1 Exhibit 6.

2 (Exhibit 6 was marked for

3 identification.)

4 BY MR. DAVIS:

5 Q From looking at your backup, specifically

6 Exhibit 3, it indicates that Bernanke started in

7 November of 2013; is that right?

8 A Yes. That's my understanding, yes.

9 Q So this would be a presentation about

10 Bernanke from a little bit less than a month prior to

11 its launch, correct?

12 A That's correct.

13 Q Do you recall what this document says about

14 the profits that Google expected to gain as a result

15 of implementing Bernanke?

16 A Well, I recall what it says about the

17 experiment results, and so that's on paragraph -- I'm

18 sorry -- on the page ending in 93, where it shows an

19 increase in Google profit of [REDACTED] a year.

20 Q And do you see here that in this estimate,

21 it's accounting for a loss in spend from [REDACTED]?

22 A Correct.

23 Q And so specifically, again, in this

24 experiment, it shows a [REDACTED] a year increase in

25 total spend from AdWords buyers and a [REDACTED] a

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1 year decrease from [REDACTED], right?

2 MR. COLLIER: Counsel, can I just get a page

3 reference? I don't know where you're reading

4 from.

5 MR. DAVIS: The one he said, 493.

6 MR. COLLIER: Thank you.

7 THE WITNESS: You read those correctly, yes.

8 BY MR. DAVIS:

9 Q And one of those, specifically the loss on

10 the [REDACTED], was projected to offset some of the

11 gain from AdWords buyers, right?

12 MR. COLLIER: Objection; form.

13 THE WITNESS: Well, over the immediate time

14 period, yes. Back to my earlier answer, though,

15 I would say over the longer term, the -- any

16 reduction from the non-Google ad tech buying tool

17 users, any reduction in that is a net positive

18 for Google over the long term, because they can

19 recapture that revenue, call it in time period 2,

20 right?

21 Time period 2, these third parties are then

22 unhappy, because they're not winning the same

23 auction, so then they could say, hey, it's better

24 for us to start using the Google ad tech tools.

25 That's the subject of this interconnected and

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1 the, kind of the long-term nature of the benefits  
2 in these product markets.  
3 I would also say that that's -- if you give  
4 me one second, because that was only one of the  
5 pages with results. There's also another page --  
6 BY MR. DAVIS:  
7 Q We're going to do the other one, too.  
8 A Okay.  
9 Q So this that we've been looking at projects  
10 a [REDACTED] a year incremental benefit resulting  
11 from Bernanke to Google writ large, correct?  
12 A That's what the slide says, yes. That's the  
13 inference that I take from the slide.  
14 Q And this is based on an experiment across  
15 [REDACTED] of queries, correct?  
16 A It says a "[REDACTED] experiment," so yes,  
17 I expect that to be [REDACTED] of queries over one  
18 week, and it would have been prior to November 2013,  
19 so right before the launch.  
20 Q And then the next page, ending 494, has an  
21 experiment with a larger dataset of [REDACTED].  
22 right?  
23 A That's correct.  
24 Q And that experiment in the month or so prior  
25 to the launch of Bernanke indicated that the

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1 incremental benefit to Google of the program as a  
2 whole was [REDACTED] per year, right?  
3 MR. COLLIER: Objection; form.  
4 THE WITNESS: So that is what the slide  
5 says, yes. There's some -- there's an asterisk  
6 in the slide. I would say you would need to  
7 consider the slide in its totality, but yes, the  
8 overall conclusion from that slide is an  
9 incremental [REDACTED] year of benefits obtained  
10 from that particular experiment.  
11 BY MR. DAVIS:  
12 Q And is this one of the experiments that you  
13 reviewed and incorporated into your analysis?  
14 A I did review it and I considered it.  
15 Ultimately I concluded the way I implemented the  
16 analysis to be reasonable, looking at it over the  
17 entirety of the time period.  
18 Q Using the [REDACTED] figure to GDN,  
19 starting in August of 2015?  
20 MR. COLLIER: Objection; form.  
21 THE WITNESS: Correct, and applying a  
22 3 percent -- in some of those scenarios, I'm  
23 applying a 3 percent growth rate, which is, in my  
24 view, very, very low, or a five -- and the other  
25 scenario is a five percent growth rate, so I

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1 think you need to consider it within the context  
2 of all the assumptions in the analysis.  
3 BY MR. DAVIS:  
4 Q Did Google's display ad revenue increase  
5 from 2014 to 2015 or decrease?  
6 A [REDACTED].  
7 Q From 2014 to 2015?  
8 A You know, I say that very quickly. Let  
9 me --  
10 Q That's okay.  
11 A Let me look in my, my -- the, the -- I  
12 recall seeing [REDACTED]  
13 but I need to make sure I have the right -- I'm  
14 looking at the right revenue table.  
15 MR. DAVIS: I'll show you what we'll mark as  
16 Exhibit 7.  
17 (Exhibit 7 was marked for  
18 identification.)  
19 BY MR. DAVIS:  
20 Q Do you see Exhibit 7 is a May 2015 email?  
21 A That's correct.  
22 Q And it's about the launch of Global  
23 Bernanke, right?  
24 A That's correct.  
25 Q And we see -- well, is this document

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1 consistent with your use of a [REDACTED] in  
2 incremental revenue figure?  
3 A Give me a minute.  
4 I guess I would need to have a little bit  
5 more context about the document. It's unclear whether  
6 they're referring to [REDACTED] as a result of Global  
7 Bernanke as compared to what I'll call plain vanilla  
8 Bernanke. So that's where I don't -- I'm not quite  
9 sure how to interpret that particular document, but it  
10 is -- certainly it's a document that states that  
11 they're expecting significant additional revenue, and  
12 they are focusing on GDN as the measure of success.  
13 There's a different number down below where  
14 it says "Google revenue," using [REDACTED] as well,  
15 so they always seem to be calling out both numbers,  
16 both the GDN and the Google revenue number.  
17 Q Because the numbers are necessarily  
18 different, right?  
19 MR. COLLIER: Objection; form.  
20 THE WITNESS: The numbers will be different  
21 over the short term. This question is about what  
22 is the appropriate estimate to use for the longer  
23 term.  
24 BY MR. DAVIS:  
25 Q And you have not done any calculation to

<p style="text-align: right;">Page 154</p> <p>1 indicate that they are equal over the long term, have 2 you?</p> <p>3 A I have not done an explicit calculation, but 4 I think the -- particularly my use of this 5 three percent growth rate or the five percent growth 6 rate are exceedingly conservative relative to the 7 actual growth rates experienced by Google in this 8 business.</p> <p>9 Q In the -- or excuse me. In the calculation 10 for Bernanke you used that starts with a [REDACTED] 11 per year incremental revenue expectation, what minimum 12 publisher revenue share -- excuse me. What minimum 13 per-publisher GDN revenue share is being assumed in 14 that analysis?</p> <p>15 A I'm sorry. Which presentation are you 16 talking about?</p> <p>17 Q Whatever you used to come up with \$450 18 million per year.</p> <p>19 A Give me a moment. Let me review that 20 particular --</p> <p>21 Q Sure.</p> <p>22 A -- presentation, because I know there was a 23 change in how Global Bernanke was implemented in -- 24 and in the revenue shares, the way the revenue shares 25 were calculated.</p>	<p style="text-align: right;">Page 156</p> <p>1 [REDACTED] a year starting point was consistent with 2 the constraints actually applied in Global Bernanke as 3 launched?</p> <p>4 A I compared the rev- -- the profit numbers 5 from that spreadsheet or the implied profit numbers 6 and the profit numbers that I'm using, with other 7 estimates of incremental profit, and I concluded that 8 they were reasonable for the purposes that I'm using.</p> <p>9 I did not further adjust or tweak those 10 numbers to try and recreate an alternative number 11 based on alternative parameters for, for Bernanke. I 12 used that as the -- as what I consider to be a 13 reasonable proxy for a long-term annual benefit that 14 was expected to continue as a result of the expected 15 Bernanke programs in all of its flavors.</p> <p>16 Q What do you think the error rate in that 17 proxy is?</p> <p>18 MR. COLLIER: Objection; form.</p> <p>19 THE WITNESS: Well, there are error bounds 20 associated with the, each of these estimates in 21 the -- that are being provided by Google in each 22 of these experiments, the Rasta, at least for 23 some of them. That doesn't -- like the ones you 24 just pointed me to that are just providing the, 25 the aggregate number, those don't have error</p>
<p style="text-align: right;">Page 155</p> <p>1 I don't see when they are -- where they are 2 calling out the minimum revenue share per publisher. 3 I don't think there -- I didn't think there was one. 4 I thought on a global basis, they were aggregating, 5 but I would need to go back and look at my, my other 6 parts of my report that talk about that.</p> <p>7 I believe there's like even discussion on, 8 for example, the page ending 96, where it talks about 9 "GDN deliberately loses money on billions of queries 10 per day, primarily to subsidize publishers and drive 11 down margin [REDACTED]," and then there's an 12 arrow to 15 percent.</p> <p>13 So I think now you're getting more into the 14 way the algorithm worked and the specific constraints, 15 and I just don't recall, as I sit here today, what 16 that was for the publisher side.</p> <p>17 Q The specific constraints have enormous 18 revenue impacts, don't they?</p> <p>19 MR. COLLIER: Objection; form.</p> <p>20 THE WITNESS: The specific constraints and 21 any changes to the programs are going to have 22 significant revenue impacts, given the magnitude 23 of commerce flowing through these auctions, yes.</p> <p>24 BY MR. DAVIS:</p> <p>25 Q What did you do to determine that your</p>	<p style="text-align: right;">Page 157</p> <p>1 bounds, but the ones in the actual experiments do 2 have error bounds associated with them.</p> <p>3 BY MR. DAVIS:</p> <p>4 Q But your [REDACTED] isn't based on an 5 experiment, is it?</p> <p>6 MR. COLLIER: Objection; form.</p> <p>7 THE WITNESS: It very much is based on an 8 experiment, shown in -- it's based on the results 9 obtained in that very first document we began 10 reading, and that has error bounds associated 11 with the parameters used to derive that number.</p> <p>12 BY MR. DAVIS:</p> <p>13 Q To the extent you're using [REDACTED] to 14 attribute the expected incremental gain to Google writ 15 large, that figure is not based on an experiment, 16 true?</p> <p>17 MR. COLLIER: Objection; form.</p> <p>18 THE WITNESS: The [REDACTED] is a number 19 that comes from a specific experiment. I did not 20 make the [REDACTED] up.</p> <p>21 It was an estimate that Google made, based 22 on GDN, and I concluded it was appropriate to use 23 in my calculations in the way that I've done, 24 principally not only because of the way in which 25 the experiment is made, but also based on my</p>



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1 understanding of the long-term benefits to Google  
2 of driving more revenue to itself and driving  
3 revenue away from competitors; and also my review  
4 of the profit numbers that I'm using, and the  
5 other parameters that I'm using to derive the  
6 penalty amount.  
7 Ultimately the question is: Taken in their  
8 totality, are my parameter estimates I'm using  
9 across the board to derive the aggregate penalty  
10 amount, are those parameter estimates reasonable  
11 in terms of the overall result and reliable in  
12 terms of the overall result, and I think that  
13 they are.  
14 (Exhibit 8 was marked for  
15 identification.)  
16 BY MR. DAVIS:  
17 Q I'm going to object as non-responsive and  
18 move to strike everything after "made, based on GDN."  
19 And I've now shown you what's been marked as  
20 Exhibit 8. This is another document put out by [REDACTED]  
21 here on July 26, 2015, right?  
22 A That is what the title says, or right below  
23 the title. Give me a moment to review it.  
24 Q We can go off the record then, if you're  
25 going to read the whole thing.

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1 MR. COLLIER: Well, no. We're not going to  
2 take his break time to read this. If you put the  
3 document in front of him --  
4 MR. DAVIS: I don't --  
5 MR. COLLIER: You want to go off the record,  
6 go off the record.  
7 MR. DAVIS: Okay. We'll go off.  
8 THE VIDEOGRAPHER: The time is 1:49 p.m.  
9 We're off the record.  
10 (Whereupon, a short recess was taken.)  
11 THE VIDEOGRAPHER: The time is 2:02 p.m.  
12 This begins unit number four. We're on the  
13 record.  
14 BY MR. DAVIS:  
15 Q Dr. DeRamus, I'll tell you that what we've  
16 marked as Exhibit 8 is on your list of materials  
17 considered, but I know you consider a lot.  
18 Is this something you recognize offhand?  
19 MR. COLLIER: Dr. DeRamus, take the time you  
20 need to answer that question.  
21 THE WITNESS: I don't recognize it offhand,  
22 without further reviewing it in detail.  
23 BY MR. DAVIS:  
24 Q In the one, two, three, four -- fifth  
25 paragraph, so under some of the numbers, it says, "The

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1 network margin of 15 percent is a business constraint.  
2 With purely this constraint, the total revenue impact  
3 would have been [REDACTED], but we have the other  
4 constraints for the following reasons."  
5 Do you see that?  
6 A I see that, but I'm sorry. This is where I  
7 need to spend more time to read the first part of  
8 that, at least, to understand the context with which  
9 those are being raised.  
10 Q Okay.  
11 (Witness peruses document.)  
12 THE WITNESS: I'm sorry. I've read through  
13 the paragraph you asked me to read, but let me  
14 just track something real quick.  
15 (Witness peruses document further.)  
16 THE WITNESS: Okay. I've read through that  
17 paragraph. I haven't finished reviewing the rest  
18 of the document.  
19 BY MR. DAVIS:  
20 Q Okay, but you do see that without further  
21 constraints, the estimated revenue impact was  
22 [REDACTED], right?  
23 A It says, "With purely this constraint, the  
24 total revenue impact would have been [REDACTED], but  
25 we have the other constraints for the following

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1 reasons," and I assume when it's talking about the  
2 other constraints, it's referring to the additional  
3 two above; i.e., the fact that it says "individual  
4 publisher margin greater than or equal to five  
5 percent," and then it has an explanation of that in  
6 the following paragraph. The following -- the other  
7 constraint is then described -- appears to be  
8 described in the next paragraph, which I have not had  
9 time to read yet.  
10 Q In your analysis, did you account for the  
11 actual constraints that were used upon the launch of  
12 Global Bernanke in 2015 with respect to individual  
13 per-publisher GDN margins or the publisher payout over  
14 current publisher payout constraint?  
15 MR. COLLIER: Objection; form.  
16 THE WITNESS: I believe I've described the  
17 calculations that I do in section 6 of my report,  
18 and those are based on all the inputs that are  
19 specified in my report and the ones we actually  
20 went through earlier on in some of the backup  
21 materials.  
22 Those are based on the documents and  
23 whatever the experiments and constraints that  
24 were imposed on those particular experiments. I  
25 did not try to -- or I was not able to rerun



<p style="text-align: right;">Page 162</p> <p>1 those experiments using alternative parameter</p> <p>2 adjustments to these programs.</p> <p>3 BY MR. DAVIS:</p> <p>4 Q If the version of Global Bernanke that was</p> <p>5 actually launched differs in material respects from</p> <p>6 the version that was experimented on and which forms</p> <p>7 the basis of your analysis, should the penalty</p> <p>8 calculation account for that difference?</p> <p>9 A Well, I think it's always important to</p> <p>10 consider all the available information, and if I were</p> <p>11 to review it and determine that additional data inputs</p> <p>12 are more reliable, I would certainly run the</p> <p>13 calculations based on those data inputs.</p> <p>14 I would say that it does -- the moment I</p> <p>15 start to run those sensitivities, I would then also</p> <p>16 need to think about the implications for all the other</p> <p>17 parameter estimates I'm using; for example, something</p> <p>18 even as obvious as the three percent annual growth</p> <p>19 rate, which is a very low growth rate associated with</p> <p>20 the revenues.</p> <p>21 Q So if your starting number got lower, you</p> <p>22 would increase the growth rate you're using?</p> <p>23 MR. COLLIER: Objection; form.</p> <p>24 THE WITNESS: No. What I'm saying is if you</p> <p>25 start to change your parameters and you're doing</p>	<p style="text-align: right;">Page 164</p> <p>1 purposely to make sure that if there were any</p> <p>2 other estimates, any other parameters that I'm</p> <p>3 using that may be overestimating, here is a way</p> <p>4 to effectively down-weight the impact of any of</p> <p>5 those changes.</p> <p>6 So yes, if I were to consider -- if I were</p> <p>7 to review holistically and had new information in</p> <p>8 front of me and new data points, points that I</p> <p>9 considered to be helpful in -- or a more reliable</p> <p>10 data point, I would consider the use of that data</p> <p>11 point, but I would also consider whether, in</p> <p>12 imposing additional conservative assumption on</p> <p>13 top of conservative assumption, that I'm</p> <p>14 ultimately deriving an aggregate deterrent</p> <p>15 penalty amount that is too low.</p> <p>16 BY MR. DAVIS:</p> <p>17 Q And so if your [REDACTED] per year</p> <p>18 starting figure for Bernanke should be more like</p> <p>19 [REDACTED], would you increase the growth rate that</p> <p>20 you are applying in that penalty calculation?</p> <p>21 A Not necessarily. I would have to consider</p> <p>22 how long, over what time period that lower parameter</p> <p>23 was being put, whether to then revisit the entire</p> <p>24 model structure and do separate adjustments for</p> <p>25 separate cash flows, based on different versions or</p>
<p style="text-align: right;">Page 163</p> <p>1 a sensitivity analysis, it's important to make</p> <p>2 sure that you look at the results holistically to</p> <p>3 make sure that the aggregate amount is a</p> <p>4 reasonable estimate of the -- of a deterrent</p> <p>5 penalty amount, and that requires a broader</p> <p>6 perspective of all --</p> <p>7 THE REPORTER: That requires --</p> <p>8 THE WITNESS: A broader perspective on all</p> <p>9 of the parameters that are being used that are</p> <p>10 driving the model.</p> <p>11 BY MR. DAVIS:</p> <p>12 Q Isn't that backwards? Aren't you supposed</p> <p>13 to start with the calculation and then get a result,</p> <p>14 rather than check the result to make sure that it's</p> <p>15 high enough?</p> <p>16 MR. COLLIER: Objection; form.</p> <p>17 THE WITNESS: The question ultimately is, is</p> <p>18 a fundamental input is the growth rate.</p> <p>19 Three percent is a phenomenally low growth rate,</p> <p>20 even at the time of the -- at this -- at the time</p> <p>21 that the projects were being implemented, the</p> <p>22 forecast, the market forecast for the growth of</p> <p>23 this business were so much higher than that</p> <p>24 growth rate.</p> <p>25 I used a very low growth rate on that</p>	<p style="text-align: right;">Page 165</p> <p>1 different iterations or different implementations of</p> <p>2 the programs.</p> <p>3 So that's what I meant in terms of you need</p> <p>4 to consider the entirety of the model holistically,</p> <p>5 but I would -- if there is a number that says</p> <p>6 [REDACTED] is the better number to use in certain</p> <p>7 portions of my calculations, I would certainly use</p> <p>8 that number. I just might make other changes at the</p> <p>9 same time.</p> <p>10 Q To offset the correction?</p> <p>11 MR. COLLIER: Objection; form.</p> <p>12 THE WITNESS: Not to offset the correction,</p> <p>13 but to try and capture a more granular view of</p> <p>14 how to estimate the ex ante benefits, given that</p> <p>15 we have complex conduct, changes in strategies</p> <p>16 implemented over a long time period.</p> <p>17 It's not a single -- it's not like we're</p> <p>18 dealing with kind of a single pinpoint act.</p> <p>19 We're talking about algorithms that were</p> <p>20 continuously experimented upon, refined, and</p> <p>21 evaluated to determine whether they are having</p> <p>22 the intended effect.</p> <p>23 BY MR. DAVIS:</p> <p>24 Q Are you -- and I'm going as to warn you.</p> <p>25 I'm switching gears a little bit. We're like</p>

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1 pivoting, so I don't want to catch you offguard.  
2 Can I start a question?  
3 A You may.  
4 Q Are you yourself offering the opinion that  
5 Google would not have implemented Bernanke if they  
6 could only implement it after disclosing it?  
7 MR. COLLIER: Objection; form.  
8 THE WITNESS: I think that goes beyond the  
9 four corners of my report. I'm estimating the --  
10 I'm ultimately dealing with issues of deterrent  
11 penalty amounts as opposed to some of the more  
12 detailed issues about the conduct.  
13 Based on my review of the documents, I  
14 consider the alleged deception to be an inherent  
15 feature of the strategies that they were  
16 undertaking, "they" meaning Google. So I have  
17 not -- well, I have not parsed it out beyond  
18 that, based on our earlier discussion.  
19 BY MR. DAVIS:  
20 Q So just to make sure -- and all I'm meaning  
21 to do is determine what we need to talk to you about  
22 versus talk to other experts or fact witnesses about.  
23 That's all.  
24 Are you offering the opinion in this case  
25 that the alleged deception in connection with Bernanke

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1 was an inherent feature of the program such that if it  
2 were disclosed, Google would not have done it?  
3 A I would agree to the first part, but I  
4 don't -- I do not go so far as the second point or the  
5 second part of your clause; i.e., I consider it to be  
6 an inherent part of these programs.  
7 There was throttling, there were concerns  
8 about revelation of information, there is a desire to  
9 change market outcomes, and to change market outcomes,  
10 even under the theories of Dr. Wiggins and Dr. Milgrom  
11 that there is a -- you would need to have that  
12 information not available to the market.  
13 So I do see that as inte- -- that there is  
14 an interrelationship between what I'll call, for lack  
15 of a better word, deception or the broader deception  
16 and the, literally the algorithms themselves.  
17 Now, the other part of your question was  
18 would they have done it anyway, and I would leave it  
19 to others to opine on that.  
20 Q Gotcha.  
21 I should have asked this before, but  
22 sometimes I don't do like the obvious lawyer things.  
23 Are all of the opinions that you've reached  
24 in this case and intend to offer at trial contained in  
25 your expert report dated September 9 of this year as

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1 amended on Friday?  
2 A As I stand here today, yes. I'm sorry. As  
3 I sit here today, yes.  
4 Q As an economist, if implementing Bernanke  
5 would have been profitable even if it were disclosed,  
6 you recognize that Google would still have had an  
7 incentive to implement it, right?  
8 MR. COLLIER: Objection; form.  
9 THE WITNESS: I think the -- ultimately a  
10 company has an incentive to engage in profit  
11 maximizing or ultimately shareholder value  
12 maximizing conduct. I think the question is  
13 whether the conduct would have had the level of  
14 expected benefits, and at a certain point that's  
15 a cost/benefit decision that the company would  
16 then make.  
17 I've never seen an evaluation of the conduct  
18 with and without disclosure at the inception of  
19 it, and so -- and there are probably also broader  
20 considerations that I -- I interpreted some of  
21 those documents to suggest that Google was  
22 concerned about negative reactions by either  
23 advertisers or publishers if they were aware of  
24 these specific strategies.  
25

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1 BY MR. DAVIS:  
2 Q In that last piece you said about documents  
3 indicating concern if Google made people aware; is  
4 that about Bernanke only or about each of Bernanke,  
5 DRS and RPO?  
6 A Now you're testing my memory. I don't  
7 recall the specific documents. I just remember it  
8 being not an occasional document, but there were a  
9 number of different documents that expressed concerns.  
10 [REDACTED],  
11 and I just don't recall which specific strategy that  
12 those related to.  
13 Q Have you yourself reviewed the May 2016 blog  
14 post that Google wrote about RPO?  
15 A The May 2016 blog post?  
16 Q Mm-hmm.  
17 A As I sit here today, I don't recall.  
18 Q Have you yourself reviewed the Help Center  
19 update did DRS from mid-2016?  
20 A Again, in terms of going back to the  
21 original document and reviewing it, I don't believe I  
22 have.  
23 I have reviewed certain statements by -- I  
24 believe it is Dr. Wiggins and maybe even some of the  
25 other Google experts who reference some of the

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1 asserted disclosures. I did not go back and pull  
 2 those documents to parse out the scope of those  
 3 disclosures.  
 4 Q If Google had two options, one of which was  
 5 not to implement Bernanke and the other of which was  
 6 to implement Bernanke only after disclosing it,  
 7 assuming that option 2 was profitable compared to  
 8 option 1, you would expect Google to have taken that  
 9 course; true?  
 10 MR. COLLIER: Objection; form.  
 11 THE WITNESS: I think it would depend on  
 12 what the assessment would have been about the  
 13 long-term benefits. I also think it would --  
 14 i.e., it's not simply one that would say, oh, we  
 15 can still run this auction and get higher  
 16 numbers.  
 17 I think there are longer term questions  
 18 about whether you would have customers opting out  
 19 of using Google products if they considered  
 20 Google using something other than a true  
 21 second-price auction, for example.  
 22 So I think there are longer term  
 23 considerations that would have to go into that,  
 24 that factor, and I think it also depends on what  
 25 you consider to be disclosure. The question is:

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1 Are they completely disclosing everything that  
 2 would have been required for users to really  
 3 understand how these auctions were being run, as  
 4 opposed to a general softball disclosure that may  
 5 have only been understandable by a few customers?  
 6 So I think a lot of it depends on, in your  
 7 hypothetical, on what the content of those  
 8 disclosures were or what the content of those  
 9 disclosures was, and the assessment of those  
 10 longer term ramifications, including the  
 11 ramifications for its competitive position.  
 12 BY MR. DAVIS:  
 13 Q Does your ex post penalty analysis in  
 14 section 6 of your report assume that Bernanke was not  
 15 bidder-truthful for the entirety of its existence?  
 16 MR. COLLIER: Objection; form.  
 17 THE WITNESS: The ex post analysis assumes  
 18 that the -- well, mathematically, it takes half  
 19 of the first year profits in from the, from the  
 20 forecast, and then the full year profits  
 21 thereafter, [REDACTED] we talked  
 22 about.  
 23 And so it's a numerical exercise, so what  
 24 does that mean in terms of -- it's really easy.  
 25 It's an expectation that I have that that

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1 provides a reasonable estimate of the actual  
 2 benefits, because that's I think the best  
 3 document I have to, to use for that calculation.  
 4 BY MR. DAVIS:  
 5 Q If Google began implementing a minimum  
 6 bid-to-win pricing rule in May of 2016 when bidders  
 7 were affected by Bernanke, does that change your  
 8 penalty analysis in any way?  
 9 MR. COLLIER: Objection; form.  
 10 THE WITNESS: If I have other documents that  
 11 provide better estimates of the actual benefits  
 12 that Google obtained from the conduct, I would  
 13 use those documents.  
 14 Right now, the document that I consider to  
 15 be most reliable for the Bernanke program was  
 16 that one that had the [REDACTED] annual revenue  
 17 benefit, again, applied with a profit margin is  
 18 probably the better thing to focus on, because  
 19 that ultimately is what drives those penalty  
 20 amounts.  
 21 BY MR. DAVIS:  
 22 Q I guess what I'm meaning to ask is: Is it  
 23 your understanding that the plaintiffs claim that  
 24 Bernanke was deceptive because it removed bidder  
 25 truthfulness from the auction process?

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1 MR. COLLIER: Objection; form.  
 2 THE WITNESS: My analysis is predicated on  
 3 the assumption that the jury were to find that  
 4 Bernanke was deceptive, and so if the jury were  
 5 to find that the deception only occurred over a  
 6 smaller range of time period, like a smaller  
 7 number of years, then in the ex post analysis,  
 8 there would be a way that the jury -- I or the  
 9 jury could use to adjust those numbers  
 10 accordingly.  
 11 I still think the ex ante approach doesn't  
 12 have that same issue. The ex ante is really an  
 13 expectation as opposed to an actual result.  
 14 BY MR. DAVIS:  
 15 Q So the ex ante approach doesn't give a  
 16 wrongdoer any incentive to stop acting in a deceptive  
 17 manner, does it?  
 18 MR. COLLIER: Objection; form.  
 19 THE WITNESS: The, the big incentive would  
 20 be not to get caught, so if you engage in  
 21 something for a very short time period, then you  
 22 should exit and take your money home.  
 23 So it's like walking away from a poker  
 24 table, so knowing when you're ahead and then  
 25 walking away, and you leave with your ill-gotten

<p style="text-align: right;">Page 174</p> <p>1 gains without having been detected and without</p> <p>2 any penalty being assessed. So I think that</p> <p>3 always -- for anybody who is engaged in repeat</p> <p>4 conduct, I think that incentive is always there.</p> <p>5 BY MR. DAVIS:</p> <p>6 Q So I'm just meaning to ask: Does the, does</p> <p>7 the penalty you calculate in the ex ante approach</p> <p>8 change if Google stopped acting in a deceptive manner</p> <p>9 a year after starting to act in a deceptive manner, or</p> <p>10 does it stay exactly the same?</p> <p>11 A On the -- I, I think it would be up to a</p> <p>12 jury determination about whether the deception was,</p> <p>13 was planned over the entire -- was expected to</p> <p>14 continue; i.e., is there a generalized course of</p> <p>15 conduct that we observe over many different programs?</p> <p>16 Do we see it evolving over time? Are there</p> <p>17 cost/benefit analyses that are constantly being used</p> <p>18 to assess whether to extend or modify a particular</p> <p>19 program?</p> <p>20 If that were the case, I think from a pure</p> <p>21 economic theory approach, I think you would still use</p> <p>22 the expected value for the deterrent penalty amount,</p> <p>23 but I also think that the jury could ultimately</p> <p>24 determine that the severity of the conduct -- i.e.,</p> <p>25 its impact -- was less because of the cessation, the</p>	<p style="text-align: right;">Page 176</p> <p>1 which I think the 13.7 percent is an underestimate of</p> <p>2 the actual commerce related to the plaintiff states.</p> <p>3 But with all those caveats in mind,</p> <p>4 literally that is the only place in the company</p> <p>5 workpapers where I apply 13.7 percent times a number</p> <p>6 to show the impact of that.</p> <p>7 Q Assuming that the court or the jury says we</p> <p>8 have to allocate to the plaintiff states as opposed to</p> <p>9 expected gain from the world. The only methodology</p> <p>10 that you have suggested to them is to take</p> <p>11 13.7 percent of the worldwide figure, true?</p> <p>12 MR. COLLIER: Objection; form.</p> <p>13 THE WITNESS: Well, I would say that there</p> <p>14 are additional ways where the jury considered</p> <p>15 that there was a need to apply a higher deterrent</p> <p>16 penalty amount. In other words, if -- it's one</p> <p>17 of the whole purpose of having my second section</p> <p>18 is I have -- I'm sorry -- section 7 is I provide</p> <p>19 an entirely different method for determining the</p> <p>20 appropriate deterrent penalty amount.</p> <p>21 I don't believe any allocation is necessary</p> <p>22 in that particular context. It's really simply</p> <p>23 what is the penalty required to cause a change in</p> <p>24 the conduct of Google, if not derivative of</p> <p>25 numbers that are specific to the plaintiffs -- to</p>
<p style="text-align: right;">Page 175</p> <p>1 voluntary cessation, kind of like the way in the, in</p> <p>2 the price-fixing scenario we talked earlier about,</p> <p>3 that one of the reasons there is leniency for the</p> <p>4 first to effectively rat out their, their</p> <p>5 coconspirators, the carrot is that they won't be hit</p> <p>6 with penalties the same way that their coconspirators</p> <p>7 are.</p> <p>8 So I think there are other ways in which the</p> <p>9 jury could adjust that number to account for that</p> <p>10 shorter time period.</p> <p>11 Q Can you go to paragraph 125 of your report,</p> <p>12 please, and my only question is about the 13.7 percent</p> <p>13 figure, and I think it's a simple one.</p> <p>14 A Sorry. Paragraph 125?</p> <p>15 Q I thought so.</p> <p>16 A Yes, I am there.</p> <p>17 Q Is the 13.7 percent the only methodology you</p> <p>18 have used to allocate the total deterrent penalties</p> <p>19 you calculate to the plaintiff states specifically?</p> <p>20 A In this section of my report, yes, that is</p> <p>21 the only way in which I do that, the mathematical</p> <p>22 calculation. I provide a lot of discussion about why</p> <p>23 I do not think that that would result in a deterrent</p> <p>24 penalty amount, why I think that would underdeter the</p> <p>25 conduct at issue, and I also describe the ways in</p>	<p style="text-align: right;">Page 177</p> <p>1 the world or the plaintiff states.</p> <p>2 But there -- the 13.7 percent is the only</p> <p>3 calculation that I performed in my report that</p> <p>4 shows how that allocation would be done. I just</p> <p>5 don't think you would necessarily draw a</p> <p>6 conclusion that that is a, the necessary or a</p> <p>7 sufficient, I should say, deterrent amount.</p> <p>8 BY MR. DAVIS:</p> <p>9 Q The ranges of penalties in section 6, other</p> <p>10 than those to which you apply the 13.7 percent figure,</p> <p>11 are based off of Google's worldwide expected gains</p> <p>12 from the three programs at issue, right?</p> <p>13 A That is my understanding, yes.</p> <p>14 Q So they're not just U.S. gains; it's the</p> <p>15 entire world, right?</p> <p>16 A That's correct.</p> <p>17 Q In your view, if Idaho were the only</p> <p>18 plaintiff in this case, the only government entity</p> <p>19 bringing an enforcement action, you would say the</p> <p>20 civil penalty payable to Idaho should be identical to</p> <p>21 the civil penalties paid to the 17 plaintiffs in this</p> <p>22 case, right?</p> <p>23 A I would say that the deterrent penalty</p> <p>24 amount still needs to be an amount sufficient to deter</p> <p>25 Google and other similarly situated companies from</p>

<p style="text-align: right;">Page 178</p> <p>1 engaging in that conduct in the past. I -- give me  2 one second.  3 I think to some extent there are other  4 sections of my report that may come into play if it  5 were literally an Idaho-only factor. So, for example,  6 there's a consideration about whether, in fact, that  7 would be overdeterrence, so if both Idaho filed, and a  8 year later, Texas also filed, then I would consider --  9 I would not consider it appropriate to effectively  10 double my numbers and say each of Idaho and Texas  11 should separately recover the entirety of -- or assess  12 the entirety of those amounts.  13 In all cases, I would still say that it is  14 capped by the legal requirements of the statutes, so  15 there is a dollars-per-violation cap. So in no event  16 would the amount that Idaho recovers would that be in  17 excess of the dollars per violation, so at some point  18 those numbers would begin to bind on the deterrent  19 penalty amounts.  20 Q Does the fact that there are two class  21 action lawsuits against Google brought by private  22 classes affect what the optimal deterrent penalty is  23 in this case?  24 A As I sit here today, I don't -- it's not  25 factored into my opinions, but I would have to look at</p>	<p style="text-align: right;">Page 180</p> <p>1 MR. COLLIER: Objection; form.  2 THE WITNESS: If it's for the identical  3 conduct, I would say yes.  4 I'm sorry. I should have said from this  5 deterrent perspective, this cost/benefit analysis  6 perspective, yes.  7 BY MR. DAVIS:  8 Q You would agree that the total harm to  9 society from unlawful conduct is one of the basic  10 considerations that matters for calculating an optimal  11 penalty from the perspective of deterrence, wouldn't  12 you?  13 A Well, I think as I describe in my report --  14 and I'm happy to walk you through the sections. I  15 think there are two different lenses you can use.  16 One is the, the harm to society, and the  17 other one is the benefit to the wrongdoer. It really  18 depends on the particular economic literature you're  19 drawing upon and whether the objective is to  20 absolutely deter the conduct or whether to effectively  21 establish a price for the conduct.  22 Q The economic literature would also dictate  23 that one take the benefits to society from unlawful  24 conduct into account, true?  25 MR. COLLIER: Objection; form.</p>
<p style="text-align: right;">Page 179</p> <p>1 those to study those in more detail.  2 Q I guess what I'm asking is: Should it be?  3 A From my perspective, in general terms, I  4 don't think so. The principle of deterrence is an  5 issue associated with the specific statutes at issue  6 here.  7 They do not appear -- or they have not  8 appeared in my experience in other cases where a  9 private litigant sues for loss profits, for example,  10 or other harms, unless, to the extent that they are  11 suing for treble damages under the antitrust  12 statutes, they may be bringing different causes of  13 action, but ultimately it would depend.  14 That's why I said it would -- I would need  15 to review in detail what the specific claims were  16 brought by those plaintiffs; i.e., were they  17 violations of the, the same, the exact same statutes  18 and claiming somehow relief, using the same statutory  19 formula.  20 Q When a private actor is doing the  21 cost/benefit analysis of whether to engage in unlawful  22 conduct, its expected total fine from that would  23 account not only for penalties in government  24 enforcement actions but also exposure in private  25 litigation, true?</p>	<p style="text-align: right;">Page 181</p> <p>1 THE WITNESS: I think in looking at the  2 social welfare side, I think there may be a --  3 literature that might describe that. That's not  4 one that I've particularly focused on, but I  5 believe that taken to its logical extreme, if  6 you're looking at social welfare and you have  7 particular conduct, then under that, the kind of  8 Gary Becker framework, I think you would look at  9 that as part of your analysis.  10 I think the deterrent literature is much  11 more focused on trying to say this is conduct  12 that we do not like, how do we prevent it from  13 occurring, so what is the dollar amount that we  14 need to establish in order to prevent it from  15 occurring in the future.  16 BY MR. DAVIS:  17 Q Understood. Scholars like Becker, Polinsky,  18 Shavell, Buccirossi, all of those folks would consider  19 the benefits to society in determining an optimal  20 penalty, true?  21 MR. COLLIER: Objection; form.  22 THE WITNESS: Well, to some extent, I think  23 you're getting into the issue of overdeterrence,  24 and that's one of the reasons why I have my  25 entire section on overdeterrence in terms of</p>



<p style="text-align: right;">Page 182</p> <p>1 looking at the impact on the plaintiff -- I'm</p> <p>2 sorry -- the impact on the defendant, but I</p> <p>3 would, I would say that in general I'd probably</p> <p>4 simply point you to my last answer, that the</p> <p>5 Becker approach, which is really about an</p> <p>6 internalization of a cost approach as opposed to</p> <p>7 an absolute deterrence approach, would look at,</p> <p>8 all-in, society, net harms, net benefits</p> <p>9 compared -- I'm sorry -- overall societal net</p> <p>10 harms compared to the gains to the wrongdoer.</p> <p>11 BY MR. DAVIS:</p> <p>12 Q The socially optimal penalty has to account</p> <p>13 for the fact that there's such a thing as an efficient</p> <p>14 violation, doesn't it?</p> <p>15 A Well, this is where I think you're moving</p> <p>16 back into the earlier literature of Becker.</p> <p>17 So Becker does have that concept of an</p> <p>18 efficient violation, and that's why I said there's a</p> <p>19 different perspective in terms of the, what I'll call</p> <p>20 the "pure deterrence literature" that says if the</p> <p>21 question before the court is what's the size of the</p> <p>22 penalty to make sure this party and other people do</p> <p>23 not engage in this conduct, because we do not consider</p> <p>24 things like deception to be a positive thing for</p> <p>25 society, because we think it undermines broader public</p>	<p style="text-align: right;">Page 184</p> <p>1 A You do, or you did, rather.</p> <p>2 Q And those are violations for which the total</p> <p>3 benefits exceed the total costs, right?</p> <p>4 A Correct, and I keep reading the rest of the</p> <p>5 sentence just to be comprehensive.</p> <p>6 Q I just want to make sure. The language in</p> <p>7 note 34 on page 14, that is your opinion, right?</p> <p>8 A No. These are -- the opinion -- I'm</p> <p>9 describing the framework that's used in what I call</p> <p>10 the "internalization literature." So this is the</p> <p>11 original Gary Becker literature. Like I said, it's</p> <p>12 the, the perspective of economists who, who use the</p> <p>13 lens of there being effectively a price for</p> <p>14 everything.</p> <p>15 Q Understood.</p> <p>16 A That there is a socially optimal way to</p> <p>17 determine violations, and I also reference the other</p> <p>18 literature that talks about the, what I would call the</p> <p>19 "pure deterrence perspective" which would focus on the</p> <p>20 penalties, the gains to the offender in trying to</p> <p>21 prevent them from doing that in the future. What's</p> <p>22 the dollar amount that will prevent them from doing</p> <p>23 it, because we don't want them to, somebody to lie,</p> <p>24 cheat or steal.</p> <p>25 Q Do you know one way or the other whether</p>
<p style="text-align: right;">Page 183</p> <p>1 policy goals or undermines faith in markets or</p> <p>2 something else.</p> <p>3 That's a different perspective than the</p> <p>4 Becker type perspective which is about an efficient</p> <p>5 level of deterrence, and even there -- which is one</p> <p>6 that says you can pay to deceive. So what's the right</p> <p>7 fine to pay? It's a price for deception. It would be</p> <p>8 the Becker type approach to it.</p> <p>9 Keep in mind that there's these additional</p> <p>10 factors that are present in that literature that also</p> <p>11 say you also need to adjust for society's preferences</p> <p>12 for the amount of resources it wants to spend on</p> <p>13 enforcement, and that there's a max- -- these maximum,</p> <p>14 maximal penalty concepts that start to come to play</p> <p>15 even under that literature.</p> <p>16 So it's not a, not a single variable change</p> <p>17 when you move from one of those literatures to the</p> <p>18 other literature.</p> <p>19 Q Will you go to page 14 of your report and</p> <p>20 look at note 34.</p> <p>21 In note 34 you write, "The socially optimal</p> <p>22 penalty makes the offender internalize all the costs</p> <p>23 and benefits of the violation, thus leading the</p> <p>24 offender to commit only 'efficient violations.'"</p> <p>25 Did I read that part correctly?</p>	<p style="text-align: right;">Page 185</p> <p>1 Bernanke, DRS and RPO either collectively or</p> <p>2 individually were net beneficial to society?</p> <p>3 A My view, based on my review of the available</p> <p>4 documents and my understanding of the particular</p> <p>5 conduct, is I would consider them to be a net</p> <p>6 negative.</p> <p>7 Q How come?</p> <p>8 A For one, taking into account Google's market</p> <p>9 position, the extent to which those policies were --</p> <p>10 occurred at the same time as its enable -- as it</p> <p>11 expanded its control over the broader ad tech markets,</p> <p>12 plural, that I consider those to be long-term negative</p> <p>13 effects.</p> <p>14 Again, this is maybe going into the -- I'm</p> <p>15 not opining on antitrust issues, but I'm talking about</p> <p>16 the portions of my report where I describe my concerns</p> <p>17 about the long-term -- the impact of these conducts on</p> <p>18 the long-term competitive structure, the fact that</p> <p>19 these conducts were directed towards earning not only</p> <p>20 incremental revenue from -- for Google, but also</p> <p>21 moving it away from competitors.</p> <p>22 Q Setting aside competitive issues, antitrust</p> <p>23 issues, market power, and just looking at the effect</p> <p>24 on publishers and advertisers' bottom lines, do you</p> <p>25 have any opinion one way or the other as to whether</p>



<p style="text-align: right;">Page 186</p> <p>1 Bernanke was net harmful or net beneficial?</p> <p>2 MR. COLLIER: Objection; form.</p> <p>3 THE WITNESS: Again, I would point you to</p> <p>4 the words in my report. I think I said in my</p> <p>5 report that I considered that the social harm was</p> <p>6 likely greater than the benefits to Google. So</p> <p>7 net/net, I would expect Bernanke and the other</p> <p>8 programs to be net negative from a societal</p> <p>9 perspective.</p> <p>10 BY MR. DAVIS:</p> <p>11 Q And in order to determine that something is</p> <p>12 net negative, you have to account for both the benefit</p> <p>13 to society and the harm to society, true?</p> <p>14 A Generally, if you are actually going to do</p> <p>15 the calculation, then it would be helpful to have all</p> <p>16 that data points to do the evaluation.</p> <p>17 I think in this case, understanding the</p> <p>18 dynamics of this particular -- of these markets, their</p> <p>19 interrelationship, Google's exceptionally high market</p> <p>20 share in a number of these different markets, the exit</p> <p>21 of competitors during the relevant time period, a</p> <p>22 whole range of factors, the -- also the high,</p> <p>23 relatively high take rate for Google overall</p> <p>24 associated with this, these markets, considered</p> <p>25 holistically.</p>	<p style="text-align: right;">Page 188</p> <p>1 Dr. Weinberg talks about whether each of the</p> <p>2 strategies, whether RPO or the other one was a net</p> <p>3 positive or net negative from either the advertiser</p> <p>4 side or the publisher side.</p> <p>5 Q How many dollars of revenue to publishers</p> <p>6 were attributed to Bernanke causing impressions that</p> <p>7 would otherwise not have cleared to instead clear?</p> <p>8 MR. COLLIER: Objection; form.</p> <p>9 THE WITNESS: Sorry. Say it one more time.</p> <p>10 BY MR. DAVIS:</p> <p>11 Q How many -- I'll ask a better question.</p> <p>12 To what extent -- by how many dollars did</p> <p>13 Bernanke increase revenues paid to publishers?</p> <p>14 A I don't recall as I sit here.</p> <p>15 Q And when publishers obtain more revenue,</p> <p>16 that's good for the internet, right?</p> <p>17 MR. COLLIER: Objection; form.</p> <p>18 THE WITNESS: Well, I think there are</p> <p>19 tradeoffs, and again social welfare calculations</p> <p>20 are always a little tricky here when you've got</p> <p>21 costs being -- the increased revenues to the</p> <p>22 publishers means there is increasing prices being</p> <p>23 paid by advertisers, and whether those increasing</p> <p>24 prices being paid by advertisers in turn are</p> <p>25 passed through to consumers in terms of higher</p>
<p style="text-align: right;">Page 187</p> <p>1 And the concerns that I understand were</p> <p>2 expressed either by Google or maybe by other writers</p> <p>3 about this, or maybe even other experts, regarding</p> <p>4 these -- the impact of these specific strategies in</p> <p>5 reducing competitive pressures, those would have led</p> <p>6 to a -- or would have contributed to Google</p> <p>7 maintaining its margins and expanding its margins and</p> <p>8 expanding its revenues in these markets.</p> <p>9 Q RPO led to increased publisher revenue,</p> <p>10 right, by definition?</p> <p>11 A It led to -- well, it led -- that's why I</p> <p>12 need to go back and look at it, because it was, it was</p> <p>13 applied to certain market participants and not others.</p> <p>14 I see that to some extent as a raising rivals' cost</p> <p>15 type strategy, if you put it in the context of, of</p> <p>16 more of an antitrust framework. Again, I'm not here</p> <p>17 to testify on antitrust framework and antitrust</p> <p>18 issues, but simply it's one of the reasons why I think</p> <p>19 of that as a net negative, because it's causing your</p> <p>20 other advertisers who are not part of the GDN to pay</p> <p>21 higher reserve prices.</p> <p>22 Q How many dollars of benefit to publishers</p> <p>23 did RPO cost?</p> <p>24 A I would have to go -- I would probably</p> <p>25 direct you either to Dr. Weinberg's -- I believe</p>	<p style="text-align: right;">Page 189</p> <p>1 prices.</p> <p>2 So I think there is a broader analysis you</p> <p>3 would need to do, but again, on a net basis --</p> <p>4 and again I just would point you back to my</p> <p>5 report where I talked about this, that I consider</p> <p>6 that, taken in its totality, that the conduct at</p> <p>7 issue, the social welfare cost was likely to be</p> <p>8 higher than the actual benefits to Google, but I</p> <p>9 don't have the data to do that calculation.</p> <p>10 BY MR. DAVIS:</p> <p>11 Q And so you can't tell me a dollar value of</p> <p>12 the harm caused by Bernanke to persons other than</p> <p>13 Google, true?</p> <p>14 MR. COLLIER: Objection; form.</p> <p>15 THE WITNESS: I have not tried to quantify</p> <p>16 that. I would say there are documents that</p> <p>17 describe the impact on some -- of some of these</p> <p>18 programs on some of the parties, and even then</p> <p>19 there's a question about whether you should even</p> <p>20 aggregate across the winners and losers, because</p> <p>21 there would be winners and losers even within a</p> <p>22 particular group, whether it's advertisers or</p> <p>23 publishers.</p> <p>24 BY MR. DAVIS:</p> <p>25 Q Same question for DRS: Do you at any point</p>

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1 calculate the social harm caused to persons other than  
2 Google by DRS?  
3 A Again, I'd just give you the same answer I  
4 just gave you for RPO.  
5 Q And same answer -- well, sorry. The  
6 original answer was for Bernanke.  
7 A Oh, I'm sorry. The same answer would apply  
8 for all three programs. I looked at the documents and  
9 particularly where Google describes the impact on  
10 different groups; i.e., advertisers or publishers.  
11 I reviewed Dr. Weinberg's analysis of the  
12 directionality of the different programs, and like I  
13 said, one of the other things I couldn't derive from  
14 the available documents would be to ascertain it at a  
15 more granular level of data that would be necessary in  
16 order to actually do the calculation.  
17 Q What is "marginal deterrence," in economic  
18 parlance?  
19 A Well, marginal -- the meaning of marginal is  
20 really at the margin. It's what is the incremental  
21 impact of a particular action or fine or whatever it  
22 is that would deter someone from going the next step,  
23 as it were. So you can think of it in a number of  
24 different contexts. It would depend on the context.  
25 Q And marginal deterrence is a recognized

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1 concept in the economic literature on optimal  
2 deterrent fines, right?  
3 A I believe so. I believe -- yes. I would  
4 say yes. I would need to look back through the  
5 specific articles that talk about marginal deterrence.  
6 Some of the -- a lot of it depends on the particular  
7 author.  
8 Q Is there sort of like a -- I don't know --  
9 canonical reference point for economic analysis of  
10 optimal finds? I'll tell you in my view, it's  
11 probably the Shavell/Polinsky article, but I don't  
12 know that.  
13 Is there one that I should look at as being  
14 sort of a North Star?  
15 MR. COLLIER: Objection; form.  
16 THE WITNESS: And ultimately you are --  
17 unfortunately, in economics, it's not like  
18 there's a Supreme Court ruling that says -- a  
19 Supreme Court of economists that says this is how  
20 everybody should do it. Different economists  
21 bring a different lens associated with how to do  
22 it.  
23 I do think the Shavell and -- is it  
24 Polinsky -- article was the -- or Shavell has a  
25 text as well. So the number -- both Shavell and

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1 Polinsky have written extensively about this. So  
2 they have studied the issue from their  
3 perspective. Others have as well.  
4 I think the -- hang on one minute. There  
5 was another one in there that I found,  
6 particularly helpful, is the Wouter Wils,  
7 W-I-L-S, "Optimal Antitrust Fines, Theory and  
8 Practice," which was more from what I consider  
9 the straight deterrence perspective, to give the  
10 contrast between that literature that talks about  
11 socially efficient violations of law versus  
12 deterrent perspectives.  
13 BY MR. DAVIS:  
14 Q And who, who is Wils? Who is that?  
15 A I would need to go back and review what his  
16 CV was. I just remember I read his article, and I  
17 found it to be a very well-written summary of the  
18 available literature.  
19 Q But you hadn't heard of him before that,  
20 right?  
21 MR. COLLIER: Objection; form.  
22 THE WITNESS: I had not, no.  
23 BY MR. DAVIS:  
24 Q Whereas somebody like Steve Shavell,  
25 naturally you had heard of, correct?

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1 A I had heard of Steve Shavell before this,  
2 yes, but I would say this whole notion of this tension  
3 between kind of the Becker perspective of social  
4 efficiency and everything having a price is a, an  
5 issue of kind some tension within the economics  
6 profession more generally. I think it applies not  
7 just to conditions of deterrence, but it also applies  
8 to antitrust; i.e., should we allow antitrust  
9 violations as long as the violator pays for the amount  
10 of its wrongdoing, which is not -- well, in any case,  
11 I'll just say that that is -- there's always been this  
12 broader tension between those economists that have  
13 that view of everything has a price versus others that  
14 have a broader perspective on the appropriate scope of  
15 economic analysis.  
16 Q Isn't it true that under the, the principle  
17 of marginal deterrence, it is important that the  
18 sanction for a more harmful act exceed the sanction  
19 for a less harmful act?  
20 MR. COLLIER: Objection; form.  
21 THE WITNESS: In general, yes, you would  
22 expect that the greater the harm, the greater the  
23 penalty should be applied.  
24 BY MR. DAVIS:  
25 Q And also under marginal deterrence, as

<p style="text-align: right;">Page 194</p> <p>1 reflected in the economic literature, isn't it</p> <p>2 important that the total sanction increase with the</p> <p>3 activity level that is wrongful?</p> <p>4 MR. COLLIER: Objection; form.</p> <p>5 THE WITNESS: I would think in general, but</p> <p>6 I think in specifics is where there, at the</p> <p>7 limit, it makes -- that that blanket statement</p> <p>8 may break down. I think there's an expectation</p> <p>9 in, in that story. If I were to make that</p> <p>10 statement, I think the caveat would always be up</p> <p>11 to some level at which you are -- particularly in</p> <p>12 a per-violation framework where the amount of the</p> <p>13 penalty becomes excessive.</p> <p>14 BY MR. DAVIS:</p> <p>15 Q And isn't it true that economists</p> <p>16 considering marginal deterrence have determined that</p> <p>17 when violations are serial in sequence over time, it</p> <p>18 is better to underdeter on the per-violation level and</p> <p>19 assure that the aggregate fine increases with each</p> <p>20 violation than to not?</p> <p>21 MR. COLLIER: Objection; form.</p> <p>22 THE WITNESS: I would need to review any</p> <p>23 articles that made that assertion, particularly</p> <p>24 when you talk about underdetering.</p> <p>25</p>	<p style="text-align: right;">Page 196</p> <p>1 other considerations as well, but yes, that would be</p> <p>2 one consideration.</p> <p>3 Q And another feature of -- actually, strike</p> <p>4 that.</p> <p>5 Another aspect of the concept of</p> <p>6 overdeterrence is we do not want to drive</p> <p>7 welfare-maximizing businesses out of business, right?</p> <p>8 A I think I have a discussion of this in my</p> <p>9 report that I'd point you to for a more complete</p> <p>10 explanation. I probably wouldn't call it</p> <p>11 "welfare-maximizing," because I think that depends on</p> <p>12 whose welfare you're talking about, but I do think</p> <p>13 that there -- I, I describe how you don't necessarily</p> <p>14 want to drive a wrongdoer out of business if they are</p> <p>15 providing broader societal benefits.</p> <p>16 There may be others that you might want to</p> <p>17 drive out of business, even if the welfare -- they're</p> <p>18 maximizing their own welfare, but they're doing so at</p> <p>19 the expense of society.</p> <p>20 Q If the net present value of a display ads</p> <p>21 business is \$2 billion, but there's a ten percent</p> <p>22 chance that you'll incur a \$25 billion fine in</p> <p>23 connection with that business, it would be</p> <p>24 economically irrational to enter that business, true?</p> <p>25 MR. COLLIER: Objection; form.</p>
<p style="text-align: right;">Page 195</p> <p>1 BY MR. DAVIS:</p> <p>2 Q Maybe I'll do an example.</p> <p>3 Well, no, that's okay. I can shortcut this.</p> <p>4 The works that you have cited, the economic</p> <p>5 literature that you have cited in your report is</p> <p>6 literature that you consider to be authoritative in</p> <p>7 your field, true?</p> <p>8 A I considered all to be reliable. I think</p> <p>9 the question is really how much weight to put on one</p> <p>10 author versus another.</p> <p>11 Q That's going to save time.</p> <p>12 The concept of overdeterrence is widely</p> <p>13 recognized in the economic literature, right?</p> <p>14 A Correct.</p> <p>15 Q One part of the concept of overdeterrence is</p> <p>16 that society does not want to deter conduct that is</p> <p>17 net welfare-enhancing, right?</p> <p>18 A I think that would be -- might be one way to</p> <p>19 frame it. I -- maybe I think of it differently, but</p> <p>20 that might be one way to frame it.</p> <p>21 Q So another way to frame or another aspect of</p> <p>22 the concept of overdeterrence is that we don't want to</p> <p>23 chill lawful behavior by overly sanctioning unlawful</p> <p>24 behavior, right?</p> <p>25 A That would be one consideration. There are</p>	<p style="text-align: right;">Page 197</p> <p>1 THE WITNESS: Well, you're saying simply by</p> <p>2 virtue of participating in an industry that there</p> <p>3 is a ten percent chance you're going to get hit</p> <p>4 with a mammoth fine associated with it, I think</p> <p>5 there are ways in which I could imagine that</p> <p>6 still being a profit-maximizing decision to make</p> <p>7 because of bankruptcy protection, because there's</p> <p>8 a chance you don't -- so there is an asymmetry in</p> <p>9 terms of the outcomes given, because of the</p> <p>10 bankruptcy laws, you might get away with it.</p> <p>11 But the bottom line is I understand your --</p> <p>12 the hypothetical, and I can see how a probability</p> <p>13 of a negative outcome can change the decision by</p> <p>14 someone to invest -- to make any particular</p> <p>15 investment.</p> <p>16 MR. DAVIS: Can we take a break?</p> <p>17 MR. COLLIER: Sure.</p> <p>18 THE VIDEOGRAPHER: The time is 2:55 p.m.</p> <p>19 This ends unit 4. We're off the record.</p> <p>20 (Whereupon, a short recess was taken.)</p> <p>21 THE VIDEOGRAPHER: The time is 3:14 p.m.</p> <p>22 This begins unit number 5. We're on the record.</p> <p>23 BY MR. DAVIS:</p> <p>24 Q Dr. DeRamus, you ready to continue with your</p> <p>25 deposition?</p>

<p style="text-align: right;">Page 198</p> <p>1 A Yes, I am.</p> <p>2 Q One of the concepts discussed in your report</p> <p>3 is what's commonly called "the principal-agent</p> <p>4 problem," right?</p> <p>5 A Correct.</p> <p>6 Q And that's a problem that arises -- and in</p> <p>7 other contexts, too, but predominantly in</p> <p>8 corporations, correct?</p> <p>9 A I would say in corporations, but it is a</p> <p>10 general, general economic problem, yes.</p> <p>11 Q In the context of large publicly traded</p> <p>12 corporations, the principal-agent problem as it's been</p> <p>13 studied arises from the separation of ownership and</p> <p>14 effective control, right?</p> <p>15 A In effect, yes.</p> <p>16 Q And that's because a corporation that's</p> <p>17 large and publicly traded is owned by many dispersed</p> <p>18 shareholders, but controlled by a group of executives</p> <p>19 and directors, right?</p> <p>20 A Correct, and I think it's also about the</p> <p>21 owners versus managers distinction, but yes.</p> <p>22 Q And the result of the principal-agent</p> <p>23 problem in corporations, as I understand it, is that</p> <p>24 the board and executives of a corporation may behave</p> <p>25 in ways that benefit them at the expense of</p>	<p style="text-align: right;">Page 200</p> <p>1 have to be this shareholder versus management,</p> <p>2 but that's the context within which I think it's</p> <p>3 appropriate to analyze this case.</p> <p>4 BY MR. DAVIS:</p> <p>5 Q Got it.</p> <p>6 Does it have to do with the typical</p> <p>7 shareholder in a public corporation not being</p> <p>8 materially affected by movements in the stock price</p> <p>9 unless those movements are substantial?</p> <p>10 A I have a pretty long section on that in my</p> <p>11 report, so I would probably refer you to that, but I</p> <p>12 say, I would say in general it's because the agents</p> <p>13 can do -- the managers can do certain things that</p> <p>14 benefit them in their compensation that are ultimately</p> <p>15 not detectable by shareholders or insufficiently --</p> <p>16 where they have the -- there's just insufficient</p> <p>17 incentives on the part of the shareholders to the</p> <p>18 effectively clamp down on managers and cause them to</p> <p>19 do something differently.</p> <p>20 Q And the, the bridge, so to speak, between</p> <p>21 the concept of the principal-agent problem on the one</p> <p>22 hand and then section 7 of your report on the other is</p> <p>23 the idea that a penalty needs to be large enough to</p> <p>24 cause shareholders to take action, right?</p> <p>25 A That is the theoretical framework that I</p>
<p style="text-align: right;">Page 199</p> <p>1 shareholders; is that right?</p> <p>2 MR. COLLIER: Objection; form.</p> <p>3 THE WITNESS: Well, it's including managers.</p> <p>4 I would say it's up and down the line. It's not</p> <p>5 necessarily just an issue about a board of</p> <p>6 directors. It's also about a -- because</p> <p>7 oftentimes you will have large shareholders</p> <p>8 sitting on the board of directors, but it's</p> <p>9 really more about management versus owners when</p> <p>10 you have a separation between the two.</p> <p>11 BY MR. DAVIS:</p> <p>12 Q Got it, and is, is the cause of the issue</p> <p>13 with the principal-agent problem in corporations that</p> <p>14 shareholders don't have oversight over the day-to-day</p> <p>15 activities of the firm?</p> <p>16 MR. COLLIER: Objection; form.</p> <p>17 THE WITNESS: It's not so much they don't</p> <p>18 have oversight. It's just that there is a</p> <p>19 different set of incentives between shareholders</p> <p>20 and managers, that the managers who are engaged</p> <p>21 in conduct, in certain conduct may do things that</p> <p>22 benefit them in the near term that are ultimately</p> <p>23 at the expense of shareholders over the long</p> <p>24 time.</p> <p>25 But it can, it can also arise -- it doesn't</p>	<p style="text-align: right;">Page 201</p> <p>1 applied to this. I wouldn't say it necessarily has to</p> <p>2 be that, since one could still arrive at the same</p> <p>3 conclusion without the principal-agent framework, but</p> <p>4 I consider that to be, as an economist, a building</p> <p>5 block to motivate the subsequent economic analysis</p> <p>6 that I do with the actual share price data.</p> <p>7 Q And is the, is the idea, in sort of</p> <p>8 layperson terms. That a big enough stock drop will</p> <p>9 cause shareholders to exercise their voting power in</p> <p>10 such a way that achieves some combination of</p> <p>11 monitoring and deterrence that prevents violations</p> <p>12 like the ones at issue?</p> <p>13 MR. COLLIER: Objection; form.</p> <p>14 THE WITNESS: I would say in general, yes,</p> <p>15 but again, I wouldn't say that's the only way.</p> <p>16 BY MR. DAVIS:</p> <p>17 Q Is the way that shareholders in a public</p> <p>18 corporation take action through casting shareholder</p> <p>19 votes?</p> <p>20 A Generally, yes.</p> <p>21 Q What, what do you know, sitting here right</p> <p>22 now, about the voting rights associated with Google's</p> <p>23 publicly traded shares?</p> <p>24 A I would say at a high level I understand</p> <p>25 there are three class of shares. There's voting</p>

<p style="text-align: right;">Page 202</p> <p>1 shares, publicly traded voting shares, publicly traded</p> <p>2 nonvoting shares. I believe those are the A and C</p> <p>3 class stock, and then there's -- I think the B class</p> <p>4 stock are the ones that are held by the founders,</p> <p>5 Sergey Brin and I believe Larry Page. I don't know</p> <p>6 if --</p> <p>7 THE REPORTER: Who is it? Sergey --</p> <p>8 THE WITNESS: Brin, B-R-I-N, and Larry Page.</p> <p>9 MR. COLLIER: That's my reminder every hour.</p> <p>10 You've got to slow down just a little bit to let</p> <p>11 her catch up.</p> <p>12 BY MR. DAVIS:</p> <p>13 Q And to this day, Mr. Brin and Mr. Page have</p> <p>14 more than 50 percent of the voting power in Google,</p> <p>15 right?</p> <p>16 A I don't recall the exact amount. I, I</p> <p>17 recall reading from Mr. Brin's deposition, I don't</p> <p>18 think he remembered either, but if -- it is a factual</p> <p>19 issue, so I would say -- it's my understanding they</p> <p>20 exert a, a lot of voting power over the stock, or they</p> <p>21 could exert substantial voting power based on their</p> <p>22 shareholdings and the, and the preferences that those</p> <p>23 shareholdings have, given the fact that there's a big</p> <p>24 chunk of nonvoting public stock.</p> <p>25 Q Would it surprise you to learn that Mr. Page</p>	<p style="text-align: right;">Page 204</p> <p>1 have to be told to change their conduct.</p> <p>2 The award by the court may be sufficient at</p> <p>3 that point to cause them to change that conduct, given</p> <p>4 the impact that that penalty has had or could have on</p> <p>5 the stock price of the company.</p> <p>6 Q But that has nothing to do with the</p> <p>7 principal-agent problem, does it?</p> <p>8 MR. COLLIER: Objection; form.</p> <p>9 THE WITNESS: Ultimately it does, yes.</p> <p>10 BY MR. DAVIS:</p> <p>11 Q Are you testifying that the principal-agent</p> <p>12 problem is relevant to the penalty analysis,</p> <p>13 notwithstanding the fact that without the</p> <p>14 participation of Mr. Page or Mr. Brin, no shareholder</p> <p>15 can cause any action at Google?</p> <p>16 A Well, I think there are fiduciary</p> <p>17 responsibilities that the, the board has, right, to</p> <p>18 all the shareholders, so when the board makes a</p> <p>19 decision, it requires it to be in the interest of its</p> <p>20 shareholders more broadly.</p> <p>21 Q And that's true always, right? It has</p> <p>22 nothing to do with stock drops or the degree of stock</p> <p>23 drops, does it?</p> <p>24 A That's correct. That is true always. That</p> <p>25 is my understanding, I should say.</p>
<p style="text-align: right;">Page 203</p> <p>1 and Mr. Brin together have a combined 51.7 percent of</p> <p>2 the Google shareholder voting power?</p> <p>3 A That would not surprise me, no.</p> <p>4 Q So when you talk about a fine large enough</p> <p>5 to incentivize shareholders to action, are you talking</p> <p>6 about a fine large enough to incentivize Mr. Page and</p> <p>7 Mr. Brin specifically?</p> <p>8 A Well, I consider it more from a big picture</p> <p>9 perspective, shareholders collectively. I think there</p> <p>10 are -- from Mr. Brin's perspective, I'm not sure what</p> <p>11 kind of fine would cause him to actually change his</p> <p>12 conduct. He did not seem to pay a lot of attention to</p> <p>13 the value of his shares in his deposition, but I</p> <p>14 consider it more of a generalized concept that as a</p> <p>15 publicly traded company, the company has an obligation</p> <p>16 to its shareholders more broadly.</p> <p>17 And so I really consider that from that</p> <p>18 lens, from -- what is the fine necessary to cause</p> <p>19 shareholders to collectively -- whether it's Mr. Brin</p> <p>20 and Mr. Page or whether it's the other shareholders --</p> <p>21 to effectuate a change in management, or at least to</p> <p>22 align the incentives, because to some extent I think a</p> <p>23 fine large enough may have self-aligning factors;</p> <p>24 i.e., you might be able to impose a very large</p> <p>25 penalty, and managers and the CEO, for example, don't</p>	<p style="text-align: right;">Page 205</p> <p>1 Q Your idea about causing a large enough stock</p> <p>2 drop has to do with incentivizing shareholder action,</p> <p>3 as you testified a few minutes ago, right?</p> <p>4 A I would say in general, yes. I don't think</p> <p>5 you have to necessarily look at it through that lens,</p> <p>6 but as an economist, I find that to be a more</p> <p>7 theoretically cohesive way of looking at the issue.</p> <p>8 Q And that's certainly what your report says,</p> <p>9 right?</p> <p>10 MR. COLLIER: Objection; form.</p> <p>11 THE WITNESS: In broad brush strokes, yes.</p> <p>12 BY MR. DAVIS:</p> <p>13 Q When you wrote your report, did you know</p> <p>14 that Mr. Brin and Mr. Page, combined, had more than</p> <p>15 50 percent of the Google voting power?</p> <p>16 A I didn't know that they had more than</p> <p>17 51 percent. I just knew that they were very large</p> <p>18 shareholders, and I think in that principal-agent</p> <p>19 section in my report, I talked about the, the issue</p> <p>20 associated with principal-agent problems in public</p> <p>21 companies and, and the role of large shareholders in</p> <p>22 that, in assessing that conduct.</p> <p>23 Q So Mr. Brin and Mr. Page are not just large</p> <p>24 shareholders, right? They're controlling</p> <p>25 shareholders?</p>



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1 MR. COLLIER: Objection; form.  
2 THE WITNESS: Based on your representation,  
3 yes.  
4 BY MR. DAVIS:  
5 Q And they are also involved in the management  
6 of the company, right?  
7 A They are involved to some extent in the  
8 management of the company.  
9 Q It makes this sort of an odd fit for the  
10 typical application of the principal-agent problem;  
11 isn't that fair?  
12 A No. Actually, I think it's very  
13 appropriate. I still think the fact that you've  
14 got -- at least Mr. Brin stated he doesn't really pay  
15 that much attention to his stock price. I'm not quite  
16 sure what is, what is it that would motivate his  
17 change in conduct.  
18 I just -- even Dr. Skinner suggests that a  
19 penalty is going to have a negative impact on the  
20 stock price, and I would consider it to be appropriate  
21 and, in fact, necessary to have an impact on the stock  
22 price to really effectuate change.  
23 Q But not because of the principal-agent  
24 problem, right? Just because, in general, large costs  
25 incentivize more change, right?

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1 MR. COLLIER: Objection; form.  
2 THE WITNESS: Well, ultimately, as an  
3 economist, I view it from that principal-agent  
4 perspective, that there are actions that the  
5 managers do, the people lower down the totem pole  
6 from Mr. Brin and Mr. Page. Those are the  
7 individuals developing these strategies and  
8 implementing strategies to the benefit of  
9 shareholders collectively, to maximize  
10 profits/shareholder value/their individual  
11 bonuses.  
12 And those are -- there's an -- in a publicly  
13 traded company, you need to account for the  
14 differences in incentives between those  
15 individuals.  
16 BY MR. DAVIS:  
17 Q How is that any different than in a  
18 privately owned company?  
19 A In a privately owned company, there's not  
20 the separation between ownership and control -- or I'm  
21 sorry -- ownership and management, and a privately  
22 held company, assume it's a small Mom and Pop cleaner,  
23 and the owner is a -- owns the cleaning business and  
24 runs the cleaning business, and that individual has a  
25 strong incentive to make sure that customers are happy

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1 every day, because they are effectively the residual  
2 claimant. After they pay all of their costs and their  
3 employees, they get all the marbles.  
4 Q And that's assuming the absence of a  
5 principal-agent problem, right?  
6 MR. COLLIER: Objection; form.  
7 THE WITNESS: Correct. There would still be  
8 a deterrent issue if the -- if there -- if the --  
9 the dry cleaner might still have an incentive to  
10 otherwise engage in actionable conduct, but it  
11 doesn't raise the same kind of principal-agent  
12 problem, since the owner then would internalize  
13 those costs.  
14 BY MR. DAVIS:  
15 Q And in our case with respect to Google, the  
16 founders are both the -- never mind.  
17 Can I ask a new question?  
18 A Yes.  
19 Q Does the fact that Mr. Brin and Mr. Page own  
20 51 percent of the voting power in Google in any way  
21 affect the application of the principal-agent problem  
22 in the context of your penalty analysis?  
23 MR. COLLIER: Objection; form.  
24 THE WITNESS: Not in a meaningful way. It's  
25 a, it's a data point, the same way that if I had

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1 a company that was 51 percent owned by one  
2 institutional shareholder, it's still a data  
3 point, and I address that in the up-front section  
4 of my report, but at the end of the day, it does  
5 not change my conclusion that an alternative way  
6 to determine an appropriate penalty amount is  
7 what is the size of the penalty that would result  
8 in an adverse -- a detectable change in the  
9 company stock price.  
10 I think particularly in this situation, the  
11 company, as large and as profitable as Google, it  
12 does lend itself to that particular lens as  
13 opposed to other companies where you might not  
14 have the same set of facts in which it might be  
15 less of an issue.  
16 BY MR. DAVIS:  
17 Q And why, why this focus on the stock price  
18 as opposed to the balance sheet?  
19 MR. COLLIER: Objection; form.  
20 THE WITNESS: I think it's largely an issue  
21 of incentives.  
22 So the, the stock price, the move -- the  
23 barometer of the stock price, probably in a  
24 fast-growing company like, like Google, where  
25 there are naturally going to be an incentive for



<p style="text-align: right;">Page 210</p> <p>1 shareholders to otherwise be perfectly happy with</p> <p>2 management, that is increasing that stock price</p> <p>3 as fast as it has grown, to basically get out of</p> <p>4 the way of -- out of managers, because those</p> <p>5 managers have made them wealthy.</p> <p>6 So when, all of a sudden, the -- and there</p> <p>7 is a chance in which management engages in</p> <p>8 actionable conduct, and yet they don't get</p> <p>9 detected, right? And then the profits continue</p> <p>10 to pour in, and the stock price continues to go</p> <p>11 up, in which case, if the -- either there's not</p> <p>12 detection or there's an insufficient penalty</p> <p>13 amount, there's no incentive by shareholders to</p> <p>14 rein in the conduct of management.</p> <p>15 So that's why the share price is that</p> <p>16 barometer that tells them, wait a second, there's</p> <p>17 something off-trend here. There's an event.</p> <p>18 This is -- this conduct is negatively impacting</p> <p>19 the value, my ownership stake in this company.</p> <p>20 BY MR. DAVIS:</p> <p>21 Q Other than your expert report, are you aware</p> <p>22 of any economic literature that suggests that public</p> <p>23 corporations should have their fines calculated</p> <p>24 differently than other sorts of entities?</p> <p>25 A Well, the literature describes the, the need</p>	<p style="text-align: right;">Page 212</p> <p>1 information that we can use, from changes in that</p> <p>2 value over time, to run experiments on what has</p> <p>3 changed valuations of those businesses.</p> <p>4 We don't have similar data for privately</p> <p>5 held companies. You could do that analysis to look at</p> <p>6 changes in the value of a privately held company, but</p> <p>7 you wouldn't be able to do it with the same level of</p> <p>8 precision as with public companies.</p> <p>9 But I have not seen anything in the</p> <p>10 literature that directly says, for example, a larger</p> <p>11 penalty should be applied to a public company as</p> <p>12 compared to a private company, because of a</p> <p>13 principal-agent problem, nor do I think -- nor have I</p> <p>14 applied effectively a premium to the penalties,</p> <p>15 deterrent penalties I've calculated, simply because</p> <p>16 they are a public company -- simply because Google is</p> <p>17 a public company.</p> <p>18 Q And similarly, are you aware of anything</p> <p>19 written down, other than your expert report, that</p> <p>20 suggest reference to a company's stock price in</p> <p>21 calculating an optimal deterrent penalty?</p> <p>22 MR. COLLIER: Objection; form.</p> <p>23 THE WITNESS: Well, there's a lot of</p> <p>24 literature on doing event analyses based on</p> <p>25 company stock prices. I have not seen anything</p>
<p style="text-align: right;">Page 211</p> <p>1 to consider adjusting the appropriate deterrent</p> <p>2 penalty amount for things like risk preferences, risk</p> <p>3 tolerance, the wealth of a particular entity, so in</p> <p>4 that respect I consider it to be correlated with a</p> <p>5 public company which tend to be larger, have greater</p> <p>6 resources than, for example, a privately held company.</p> <p>7 Q I'm asking just about public versus private.</p> <p>8 Are you aware of anything written down, other than</p> <p>9 your expert report, that suggests that there is a way</p> <p>10 to calculate optimal deterrent penalties for public</p> <p>11 corporations that cannot be used for private</p> <p>12 corporations?</p> <p>13 MR. COLLIER: Objection; form.</p> <p>14 THE WITNESS: I'm sorry. Say that one more</p> <p>15 time.</p> <p>16 BY MR. DAVIS:</p> <p>17 Q Are you aware of anything written down,</p> <p>18 other than your expert report in this case, that</p> <p>19 suggests that there is a particular way to calculate</p> <p>20 optimal deterrent fines for public corporations as</p> <p>21 opposed to other sorts of entities?</p> <p>22 A I think that's the part where I'm struggling</p> <p>23 a little bit, because I do think there's lots of</p> <p>24 literature about publicly traded companies. They have</p> <p>25 a value. We can measure that value. There's a lot of</p>	<p style="text-align: right;">Page 213</p> <p>1 in the literature that talks about deriving a</p> <p>2 specific penalty amount based on the company's</p> <p>3 stock price.</p> <p>4 I would say it is -- there are references to</p> <p>5 the aggregate wealth of the, the offender; that</p> <p>6 the aggregate wealth is an indication that</p> <p>7 wealthier companies or individuals, a deterrent</p> <p>8 penalty may need to be higher than other</p> <p>9 companies, but not in the way that I have applied</p> <p>10 it here.</p> <p>11 BY MR. DAVIS:</p> <p>12 Q Are you aware of anything written down,</p> <p>13 other than your expert report in this case, that uses</p> <p>14 a stock market event study in connection with</p> <p>15 calculating an optimal deterrent penalty?</p> <p>16 A Well, I would say in securities cases, there</p> <p>17 are lots of cases in which you look at -- do event</p> <p>18 studies in order to determine the amount of some kind</p> <p>19 of monetary sanction. I haven't seen it in the</p> <p>20 context of a statute that was one that called for a</p> <p>21 deterrent penalty number.</p> <p>22 Q And securities litigation is literally about</p> <p>23 the stock market, isn't it?</p> <p>24 A Well, it's about conduct that led --</p> <p>25 correct, that would have been reflected in a company's</p>

<p style="text-align: right;">Page 214</p> <p>1 stock price.</p> <p>2 Q Which is distinct from the facts at issue in</p> <p>3 this case, fair?</p> <p>4 A Correct, only insofar -- I would say the</p> <p>5 conduct at issue here helped to support the company</p> <p>6 stock price, because it generated a substantial amount</p> <p>7 of profits.</p> <p>8 Q And in a securities fraud case, the harm to</p> <p>9 be redressed is itself movement, or the lack thereof,</p> <p>10 in an issuer's stock price, true?</p> <p>11 A At issue is the conduct that led to the</p> <p>12 increase in the company's stock price, yes.</p> <p>13 Q So it makes sense to do event studies in</p> <p>14 that context, doesn't it?</p> <p>15 A Give me a second. I think there's plenty of</p> <p>16 context in which economists and financial analysts use</p> <p>17 event studies in all sorts of contexts, regardless of</p> <p>18 whether it's a securities -- a 10(b)(5) type case.</p> <p>19 THE REPORTER: A securities what five?</p> <p>20 THE WITNESS: A securities case or</p> <p>21 irrespective of whether it's a 10(b)(5) case.</p> <p>22 THE REPORTER: 10(b)(5) case. Okay.</p> <p>23 THE WITNESS: So I'm sorry. Could you give</p> <p>24 me one second?</p> <p>25</p>	<p style="text-align: right;">Page 216</p> <p>1 correct?</p> <p>2 Q Yeah, and then the next couple, I think,</p> <p>3 too.</p> <p>4 Did you do anything to assess or investigate</p> <p>5 the similarity of the conduct at issue in those</p> <p>6 matters as compared to this matter?</p> <p>7 A I would say I, I looked at it generally, but</p> <p>8 the focus of my analysis was not necessarily on the --</p> <p>9 I wasn't using it as a comparable, for example.</p> <p>10 I was -- so I saw Dr. Wiggins' criticism of</p> <p>11 some of these, and particularly his criticism of</p> <p>12 Jeffrey Andrien's use of some of these, and I, I</p> <p>13 disagreed with some of Wiggins' criticism in that</p> <p>14 regard, in terms of his statement that these are too</p> <p>15 far removed or unrelated to the conduct at issue, but</p> <p>16 the purpose I'm using it for here in my analysis is</p> <p>17 different.</p> <p>18 Q Are you aware of any significant fines or</p> <p>19 settlements having to do with Google's digital display</p> <p>20 ad technology?</p> <p>21 A Digital display ad technology? I don't</p> <p>22 believe so.</p> <p>23 Q Are you aware of any significant fines or</p> <p>24 settlements that had to do with the lack of</p> <p>25 disclosure?</p>
<p style="text-align: right;">Page 215</p> <p>1 BY MR. DAVIS:</p> <p>2 Q Yes. I'll also tell you I'm good to move on</p> <p>3 to the next piece, and we can do it to where, if you</p> <p>4 have a take over the course of the day, you're welcome</p> <p>5 to give it to me, rather than waiting, now. Is that</p> <p>6 good?</p> <p>7 A That's good. If I could just amend my prior</p> <p>8 answer, just to say that I've used event studies in a</p> <p>9 wide range of contexts, including outside of</p> <p>10 securities cases.</p> <p>11 Q Got it.</p> <p>12 Can you go to paragraph 129 of your report,</p> <p>13 please. And I don't have detailed questions. I'm</p> <p>14 just framing where we're at in your analysis.</p> <p>15 A I'm sorry. Paragraph 129?</p> <p>16 Q Yes. It's pages 71 and 72.</p> <p>17 A Yes.</p> <p>18 Q And it includes a list of fines and</p> <p>19 settlements.</p> <p>20 A Yes.</p> <p>21 Q And those are a list of regulatory actions</p> <p>22 against Google resulting in fines or settlements,</p> <p>23 right?</p> <p>24 A I would say regulatory or enforcement</p> <p>25 actions, and here you're referring to paragraph 129,</p>	<p style="text-align: right;">Page 217</p> <p>1 A Well, there's some that I think were</p> <p>2 brought, brought under various deceptive conduct or</p> <p>3 unfair competition type statutes. I believe Jeffrey</p> <p>4 Andrien addresses those in his rebuttal report.</p> <p>5 So I'm aware that there are others that --</p> <p>6 other types of conduct that involved alleged</p> <p>7 deception, such as I think one was geo-tracking. That</p> <p>8 was one, for example, but again I didn't do that type</p> <p>9 of review that, that Andrien did.</p> <p>10 Q How would additional monitoring or changed</p> <p>11 incentives in connection with any of these past fines</p> <p>12 have caused Google not to engage in the violations</p> <p>13 associated, in your view, with Bernanke, DRS or RPO?</p> <p>14 A Well, I think that's the -- the point of my</p> <p>15 analysis is that notwithstanding the imposition of</p> <p>16 significant fines in the past, Google, Google's stock</p> <p>17 price didn't change as a result.</p> <p>18 That's the main thing, that Google's stock</p> <p>19 price didn't change as a result of those, and</p> <p>20 therefore in this case, I would not expect a change in</p> <p>21 Google's conduct, absent the imposition of a fine</p> <p>22 sufficiently large as to cause that price change.</p> <p>23 Q I'm going to try another example, because</p> <p>24 I'm having trouble putting it in a question.</p> <p>25 If this year I get fined for illegal sports</p>

<p style="text-align: right;">Page 218</p> <p>1 betting, and then next year I get fined for speeding</p> <p>2 in my car, would it be reasonable to surmise that I</p> <p>3 did not respond correctly to my incentives from the</p> <p>4 fine for sports betting, because I committed some</p> <p>5 distinct violation the following year?</p> <p>6 MR. COLLIER: Objection; form.</p> <p>7 THE WITNESS: It might be reasonable to draw</p> <p>8 that inference for a jury to say that, that here</p> <p>9 is an individual who -- well, but again, I</p> <p>10 shouldn't say what is reasonable for a jury to</p> <p>11 include.</p> <p>12 I would say from an -- it may indicate to</p> <p>13 me, as an economist, that there is a certain</p> <p>14 amount of risk-taking behavior, and that a prior</p> <p>15 fine of a certain amount wasn't enough for</p> <p>16 someone to focus on engaging only in lawful</p> <p>17 conduct.</p> <p>18 So I think it can have some relevance. I</p> <p>19 think it all depends on how far you want to take</p> <p>20 that particular data point.</p> <p>21 BY MR. DAVIS:</p> <p>22 Q The degree to which the sanctioned conduct</p> <p>23 is similar matters with respect to its relevance in</p> <p>24 predicting an optimal fine in a given instance, right?</p> <p>25 MR. COLLIER: Objection; form.</p>	<p style="text-align: right;">Page 220</p> <p>1 report to really understand the specific</p> <p>2 wrongdoing at issue, to understand whether this</p> <p>3 is a reasonable framework to apply.</p> <p>4 BY MR. DAVIS:</p> <p>5 Q And what analysis, if any, did you do of</p> <p>6 Google's responses to any of the privacy-related fines</p> <p>7 that you list?</p> <p>8 A Well, those went into the econometric</p> <p>9 analysis to determine whether the stock price moved in</p> <p>10 response to those fines.</p> <p>11 Q My question -- and it may have been a bad</p> <p>12 one, but I'm meaning to ask whether you did any</p> <p>13 investigation or analysis as to whether Google</p> <p>14 increased its monitoring, supervision or prevention</p> <p>15 practices following those privacy-related fines?</p> <p>16 A I understand now.</p> <p>17 I did not look to see what they had done</p> <p>18 with regard to those -- response to those</p> <p>19 privacy-related fines.</p> <p>20 Q Same question as to the competition-related</p> <p>21 fine: Did you do any analysis or investigation into</p> <p>22 whether those fines were sufficient to cause Google to</p> <p>23 take any increased measures with respect to monitoring</p> <p>24 or supervision?</p> <p>25 A I guess the short answer is no, but the</p>
<p style="text-align: right;">Page 219</p> <p>1 THE WITNESS: I think it depends on how you</p> <p>2 use it. Here, I'm using it from a different</p> <p>3 perspective; namely, is a fine of a sufficient</p> <p>4 magnitude as to cause a decline in the company's</p> <p>5 stock price.</p> <p>6 And I think one of the, one of the reasons</p> <p>7 why early on in that section I described the</p> <p>8 example of Apple, where it continued to engage in</p> <p>9 a violation up to the statutory maximum in a</p> <p>10 particular geographic area; namely, the</p> <p>11 Netherlands, and I -- as an economist, I take the</p> <p>12 inference that says that the maximum fines that</p> <p>13 it was going to be subject to were not</p> <p>14 sufficiently large to cause it, from a</p> <p>15 cost/benefit perspective, to change its conduct.</p> <p>16 BY MR. DAVIS:</p> <p>17 Q Is it your opinion that a fine should be</p> <p>18 calculated to be high enough to deter the wrongdoer</p> <p>19 from engaging in any future wrongdoing or only</p> <p>20 wrongdoing of the sort for which they're being fined?</p> <p>21 MR. COLLIER: Objection; form.</p> <p>22 THE WITNESS: I don't think it's of any</p> <p>23 wrongdoing. I think it is -- I think that's one</p> <p>24 of the reasons why you need to go through the</p> <p>25 whole analysis I do in the first part of my</p>	<p style="text-align: right;">Page 221</p> <p>1 longer answer is I do understand that there are</p> <p>2 ongoing antitrust cases outstanding, including penalty</p> <p>3 phases in -- that are still pending in the search</p> <p>4 case, for example.</p> <p>5 So there are a number of ongoing cases</p> <p>6 associated with that conduct. It's not like the</p> <p>7 anticompetitive at issue. It's simply a single</p> <p>8 behavioral, a single behavioral type conduct.</p> <p>9 Q Sure. Did you do any investigation of</p> <p>10 Google's response, if any, to the accusations of</p> <p>11 anticompetitive conduct when those enforcement actions</p> <p>12 were begun?</p> <p>13 A Other than my understanding that Google has,</p> <p>14 has litigated -- has asserted that those claims are</p> <p>15 not valid and has asserted its own defenses against</p> <p>16 those claims. Nothing other than that.</p> <p>17 Q Isn't it true that you have assumed that if</p> <p>18 Google's stock price didn't move a meaningful amount,</p> <p>19 that Google did not respond to any fines in an</p> <p>20 adequate manner?</p> <p>21 MR. COLLIER: Objection; form.</p> <p>22 THE WITNESS: No.</p> <p>23 BY MR. DAVIS:</p> <p>24 Q What data do you have to indicate that a</p> <p>25 fine leading to what you view to be an insignificant</p>

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1 stock drop was one in which Google didn't respond with  
2 adequate increased monitoring or supervision?  
3 A The question is what is the penalty that  
4 should be -- to be -- that should be imposed in order  
5 to prevent Google or to disincentivize Google from --  
6 or others similarly situated parties from engaging in  
7 similar conduct in the future, and you don't throw out  
8 that ex ante approach, that probabilistic approach  
9 that you -- that I look at in section 6.  
10 And in my opinion, it has to -- the size of  
11 the penalty, given the scope of the conduct and the  
12 type of conduct and severity of the conduct, should be  
13 sufficient enough to cause that -- some kind of stock  
14 price reaction.  
15 So that's why it is a different method.  
16 It's a different approach than my approach in section  
17 6, but I consider it ultimately a question of a  
18 signaling issue. It provides the signal to  
19 shareholders and to the company that, in the future,  
20 management should not engage in this or similar types  
21 of conduct.  
22 Q And I just want to be clear, because I  
23 understand that opinion, but your opinion that a  
24 penalty needs to be large enough to have a material  
25 stock price impact has nothing to do with Google's

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1 past fines or settlements in other cases, because you  
2 didn't investigate Google's responses to those fines  
3 or settlements, true?  
4 A Sounds like --  
5 MR. COLLIER: Objection. Sorry. Objection;  
6 form. Go ahead.  
7 THE WITNESS: It just sounds like you're  
8 asking a different question than I was trying to  
9 answer.  
10 BY MR. DAVIS:  
11 Q Okay.  
12 A So the question I'm trying to answer is what  
13 is the appropriate penalty in this case that should be  
14 applied, using economic principles of deterrence,  
15 to -- in order to address the conduct at issue.  
16 And given the magnitude of Google, and given  
17 the large number of other prior violations, I consider  
18 those to be relevant data points with which to assess  
19 how big should that number be. There are lots of ways  
20 -- we can do a different hypothetical, right, or just  
21 assume that the jury were to only impose a fine of a  
22 billion dollars.  
23 I do not think -- based on my review of the  
24 data, I don't think a billion dollars will have a  
25 single effect on the future incentives of any Google

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1 manager, independently of any other action they might  
2 take, to change their conduct. They -- will the  
3 conduct, in my view, will there still remain  
4 incentives to Google and to its shareholders for this  
5 or similar conduct, either by Google or by other  
6 similarly situated companies, to engage in that  
7 conduct in the future?  
8 Q I just want to be clear. Your opinion is  
9 that a billion dollar fine on Google would not have a  
10 single effect on the future incentives of any Google  
11 manager, independently of any other action -- well,  
12 let me go back.  
13 Is it your opinion that a fine of \$1 billion  
14 would not have an effect on any Google manager?  
15 MR. COLLIER: Objection; form.  
16 THE WITNESS: It would not have a sufficient  
17 deterrent effect to remove the incentives to  
18 engage in conduct of this type.  
19 BY MR. DAVIS:  
20 Q Because, in your view, it wouldn't move the  
21 stock price enough, right?  
22 A Well, again, within the -- I cannot --  
23 setting aside my prior analysis based on my  
24 understanding of the benefits, the expected benefits  
25 relative -- and the lack of any impact on the stock

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1 price, I would have seen -- I would see that, on an  
2 MPV basis, if I were a shareholder, having all that  
3 information, all the information available to me  
4 today, I would say terrific, good job. We engaged in  
5 this conduct, that even though we have a billion  
6 dollar penalty assessed against the company, it didn't  
7 affect the value of my shareholdings in any  
8 significant degree. It allowed us to earn substantial  
9 profits over this time period and to continue to earn  
10 profits into the future.  
11 That, to me, is an outcome that I don't  
12 think is consistent with economic principles.  
13 Q And I am only asking about section 7 right  
14 now, not section 6.  
15 Your analysis in section 7 starts with the  
16 premise that any fine that does not move the stock  
17 price enough does not affect the incentives of  
18 Google's executives and employees; isn't that true?  
19 MR. COLLIER: Objection; form.  
20 THE WITNESS: Well, within the context of  
21 this conduct in this case. That's why I think I  
22 hope I said -- or I will clarify my prior answer.  
23 In the context of this case, I do not think  
24 that a fine of less than a billion dollars or  
25 even a billion dollars would change the

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1 incentives of Google management writ large from  
2 engaging in this conduct in the future, or to --  
3 nor would it change the incentives of another  
4 similarly situated company, given the entire  
5 analysis that I've done in the prior sections of  
6 my report.  
7 Now, there may be other conduct that an  
8 employee, an individual employee may be  
9 disincentivized from undertaking. That doesn't  
10 require a billion dollar penalty. I agree with  
11 that statement.  
12 BY MR. DAVIS:  
13 Q So without your section 6 analysis, in which  
14 you conclude that the conduct at issue resulted in  
15 [REDACTED] to Google, your  
16 section 7 analysis doesn't make any sense, fair?  
17 MR. COLLIER: Objection; form.  
18 THE WITNESS: No, I wouldn't say it doesn't  
19 make any sense. I would say it is informed by  
20 the documents that I saw and used in section 6.  
21 It doesn't necessarily have to be derived on the  
22 back of the calculations that I did in section 6,  
23 but it's one of the reasons why I start in  
24 actually 3 -- 3, 4, 5, and 6 -- to understand the  
25 type of conduct, the likely impact of that

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1 conduct, the scope of commerce affected or  
2 potentially affected, and, and then to analyze  
3 the documents that -- I tried to estimate the  
4 benefit or, in fact, do estimate the benefit to  
5 Google from engaging in that kind of -- that  
6 conduct. That's not information that I throw out  
7 simply because I go to the analysis in section 7.  
8 I would say that informs my view that this  
9 is the kind of conduct that an analysis in  
10 section 7 provides a meaningful data point that  
11 one could use to derive a deterrent penalty  
12 amount.  
13 BY MR. DAVIS:  
14 Q Without first determining that the conduct  
15 at issue resulted in [REDACTED]  
16 [REDACTED] to Google, you would not advocate for the  
17 methodology in section 7 of your report, true?  
18 MR. COLLIER: Objection; form.  
19 THE WITNESS: I would not propose using the  
20 methodology in section 7 if a Google employee got  
21 a speeding ticket.  
22 So I consider section 7 to be appropriate  
23 and the numbers that I derive in section 7 to be  
24 appropriate, based on a totality of my analysis  
25 of the conduct at issue in this case.

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1 BY MR. DAVIS:  
2 Q But the numbers in section 7 are in no way  
3 derived by reference to the benefits to Google  
4 resulting from the conduct at issue or the harm to  
5 others in connection with the conduct at issue,  
6 correct?  
7 A Those are not data inputs into it, but they  
8 are certainly factors that I consider in considering  
9 it to be a reasonable approach.  
10 Q How much harm does a piece of misconduct  
11 have to cause for your analysis in section 7 to be an  
12 appropriate response?  
13 A I don't know the exact number as I sit here  
14 today, but I would say certainly I consider it to be a  
15 reasonable approach in this case, and the numbers to  
16 be on the very low end of the numbers that are derived  
17 in section 6.  
18 Q If conduct causes \$100 million of harm, can  
19 we use your section 7 analysis to calculate an optimal  
20 deterrent fine?  
21 MR. COLLIER: Objection; form.  
22 THE WITNESS: I think it would depend on the  
23 size of the company, the type of company at  
24 issue. If you're talking about Google as opposed  
25 to a different company, I would, I would think --

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1 I would probably use that factor to probably  
2 reduce the range of the deterrent penalty  
3 amounts.  
4 If I had an independent estimate of  
5 \$100 billion, then I would say that's the better  
6 estimate and leave it at that, without -- here, I  
7 have two different ways of doing it, and I  
8 provide those as alternative ways and frameworks  
9 for the, for the jury to consider, but if there's  
10 a real disparity between the two, and if you get  
11 a much lesser number, using -- and I have good  
12 estimates of the benefits to Google, and it was  
13 \$100 million, then I would probably look at --  
14 and I had a good estimate of the probability of  
15 detection and enforcement, then that may be the  
16 better way to go.  
17 BY MR. DAVIS:  
18 Q So the section 7 analysis is the way to go  
19 only if you get a number similar to what you already  
20 got in section 6?  
21 A Not similar. It informs my opinion. It  
22 says I know the order of magnitude of the, of the  
23 benefits that Google expected to obtain at the time,  
24 and so there's just -- there are two ways to go down  
25 that road, either forecast the expected future



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1 benefits and identify the probabilities of detection  
2 and enforcement, or alternatively, go straight to the  
3 magnitude of a penalty that would require an  
4 adjustment -- that would cause a sufficient change in  
5 the stock price to, to cause a change in behavior -- a  
6 change in incentives on a going-forward basis.  
7 Q And when defining a sufficient change in the  
8 stock price, you do that without reference to the  
9 benefits resulting from or harm caused by the conduct  
10 at issue, true?  
11 MR. COLLIER: Objection; form.  
12 THE WITNESS: Well, as I said before, I  
13 don't use my analysis in section 6 as an input  
14 into my calculations in section 7, but my overall  
15 assessment of the reasonableness of the section 7  
16 results is informed by the analysis and the  
17 documents that I look at in section 6 and in the  
18 other sections as well.  
19 BY MR. DAVIS:  
20 Q Would you call that circular reasoning?  
21 MR. COLLIER: Objection; form.  
22 THE WITNESS: No. I think in many ways,  
23 economists or any, anyone tasked with identifying  
24 or estimating monetary remedies, I think it's  
25 appropriate to look at a wide range of data using

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1 different assumptions and different  
2 methodologies, and asking whether a particular  
3 result is reasonable. I think to some extent,  
4 it's a sanity check.  
5 BY MR. DAVIS:  
6 Q If for some reason you weren't allowed to  
7 prevent -- to present the analysis in section 6, would  
8 you present the analysis in section 7 as a standalone  
9 assessment of optimal deterrent penalties?  
10 A I, I consider section 7, on a standalone  
11 basis, to be a reliable approach. I would also point  
12 to the broader set of factors that I considered in the  
13 previous sections of my report; i.e., I wouldn't at  
14 this point -- I'm trying to figure out if your  
15 question is assume complete ignorance about the facts  
16 of the case, and now if you don't -- if I did not know  
17 anything about the conduct of the case, would I offer  
18 section 7 as a standalone piece.  
19 No, I wouldn't. I would always offer it  
20 within the context of my understanding of the facts of  
21 the case, the documents, and the empirical analyses  
22 that the company itself did.  
23 Q If Google's conduct caused \$500 million of  
24 harm to society, would you stand by the results of  
25 your section 7 analysis?

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1 MR. COLLIER: Objection; form.  
2 THE WITNESS: Well, \$500 million, it depends  
3 on how you do the calculation, but let's call  
4 that \$500 million in MPV as of the date of the  
5 jury trial or the date of collection -- expected  
6 date of collection. Then multiply that and  
7 assume that the jury found that a probability of  
8 ten percent was reasonable, then you're up in the  
9 five billion dollar range for an aggregate  
10 deterrent penalty amount.  
11 And I would probably say at that point, it  
12 was likely sufficient, if I had sufficient  
13 confidence in -- that the \$500 billion -- the  
14 \$500 million that I started with was all-  
15 encompassing; i.e., if I knew with certainty that  
16 that had all the benefits, financial benefits  
17 that Google had.  
18 Here, I think the issue that I am -- that I  
19 have tried to ascertain is how to make that  
20 assessment of optimal or appropriate deterrent a  
21 range of deterrent penalties, given the breadth  
22 of Google's conduct, given the specific nature of  
23 this -- of these interrelated products, and the  
24 long-term benefits Google likely obtained from  
25 that conduct.

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1 BY MR. DAVIS:  
2 Q Okay. Try it this way.  
3 Dr. Wiggins calculates [REDACTED] in  
4 benefit to Google, resulting from the alleged conduct  
5 at issue. Assuming he's right -- I'm not asking you  
6 to sign off on him being right. Assuming he's right,  
7 would you stand by your analysis in section 7 and say  
8 that we should impose a 20 something billion dollar  
9 fine on Google?  
10 MR. COLLIER: Objection; form.  
11 THE WITNESS: I'm having a really hard time  
12 accepting the hypothetical that he's right. So  
13 maybe if I could phrase it a different way, and I  
14 would say if I had calculated benefits of  
15 \$45 million to Google from the conduct, I would  
16 not -- I would conclude that the \$5 billion --  
17 that the analysis in section 7 was likely too  
18 high, and that I would suggest -- I may still use  
19 that to try and figure out what lesser amount  
20 might be necessary, but I don't think that the --  
21 the range would not -- I would not be proposing a  
22 \$9 billion -- or I'm sorry -- minimum of a  
23 \$12 billion penalty in section 7 if I only  
24 concluded that at the end of the day, there was a  
25 \$45 or a \$44 million benefit to Google.



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1 BY MR. DAVIS:  
2 Q I take it you believe that Google's stock  
3 trades in an efficient market; yes?  
4 MR. COLLIER: Objection; form.  
5 THE WITNESS: With some caveats, yes.  
6 Reasonably efficient. There's a question about  
7 weak versus strong form efficiency, but yes, I  
8 would say -- put that aside, but I would say yes.  
9 BY MR. DAVIS:  
10 Q You would agree that Google's stock trades  
11 in the market in which at least all public information  
12 is incorporated into the stock price, right?  
13 A Yes, that's my general view of how financial  
14 market work.  
15 Q And it's incorporated quickly and  
16 completely; yes?  
17 MR. COLLIER: Objection; form.  
18 THE WITNESS: Yes, relatively quickly. It  
19 depends, but yes.  
20 BY MR. DAVIS:  
21 Q The assumptions you're making in your  
22 analysis in section 7 is that it's incorporated  
23 completely at least within ten days, right?  
24 A Correct.  
25 Q Okay, and actually event studies like the

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1 one you perform in section 7 are actually what were  
2 used to prove the validity of the efficient capital  
3 markets hypothesis, right?  
4 A I think they have been used in that context  
5 in the past, but I would need to go back and look at  
6 the literature before I sign on to it too much, simply  
7 because I think there is a vigorous debate about  
8 efficient market hypothesis.  
9 Q Okay, but you're assuming that the market is  
10 efficient?  
11 A As I said, I think it's -- I consider it to  
12 be reasonably efficient. We don't to debate strong  
13 versus weak form efficiency, but yes, it is efficient  
14 in the sense that I am analyzing the extent to which  
15 information, public information is reflected in the  
16 price of Google stock and particularly in the change  
17 in the price of Google stock relative to the market  
18 indices, and I do that analysis over a relatively  
19 short time period.  
20 Q And based on that framework, if Google  
21 announces tomorrow previously unforeseeable  
22 information that it had miscalculated its total cash  
23 on hand, and inflated that amount by \$1 billion in its  
24 securities filings, we can actually calculate roughly  
25 what we expect the amount of Google's stock drop to

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1 be, right?  
2 A I think it would depend on how the market  
3 were to react to that information, whether it was  
4 simply a reflection of a one-time drop versus a, a  
5 reflection of ongoing conduct or some kind of  
6 underlying issue, but I think -- as an economist, I  
7 think that the, the value of the company would be less  
8 if they woke up and they said we don't have a billion  
9 dollars that we thought we had, but the question is  
10 whether -- there's a different question, which is  
11 whether that is a large enough penalty to actually be  
12 detected by the market. I'm sorry. Not a penalty.  
13 Whether that's a large enough change to cause a  
14 detectable change in the stock price.  
15 Q I'm just meaning that if tomorrow, the world  
16 learns information about Google that makes Google  
17 worth \$1 billion more, we can calculate how much we  
18 would expect Google's stock to increase by; yes?  
19 A We can calculate how much we would expect it  
20 to increase. The question is whether it's detectable.  
21 Yes, you can calculate it.  
22 Q Okay, and similarly, if Google receives a  
23 \$20 billion fine tomorrow that was previously  
24 unforeseen, but 100 percent enforceable, we can  
25 calculate how much Google's stock is going to drop,

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1 can't we?  
2 A We can calculate our expectation of how much  
3 the value of the company should drop. There's a  
4 different question about how much the stock actually  
5 will drop, because that is going to depend on  
6 shareholder expectations about whether that has  
7 long-lasting effects and whether it's going to change  
8 the growth of that company's future cash flows.  
9 Q It could drop even more than the value of  
10 20 billion dollars spread across Google's publicly  
11 traded shares, right?  
12 A It could drop more, it could drop -- or it  
13 could drop less.  
14 Q Under what circumstances would it drop less?  
15 A Well, if the -- it's one of the things that  
16 I've seen in the data, is that you don't detect the  
17 change in stock price. You have a lot of simultaneous  
18 release of information coming out every day that's  
19 affecting the price of Google's stock.  
20 So the same day that they announce a  
21 \$20 billion fine, if Google comes out with the  
22 greatest thing in AI, then the news about the greatest  
23 thing in AI will likely swamp the \$20 billion change.  
24 That's why I said I agreed with you in terms  
25 of as an economist, from a fundamental value

<p style="text-align: right;">Page 238</p> <p>1 perspective, I think the value of the future cash</p> <p>2 flows has dropped by \$20 billion, but the stock price</p> <p>3 will reflect other information that is going on at the</p> <p>4 same time.</p> <p>5 Q Well, if there's a day with \$80 billion</p> <p>6 worth of good news for Google and a \$20 billion fine,</p> <p>7 you would expect its market cap to decrease by</p> <p>8 \$60 billion; yes?</p> <p>9 A If that were calculated by investors in the</p> <p>10 same way, I think the better way to say it is, I</p> <p>11 expect, as an economist, the value of the company to</p> <p>12 only increase by \$60 billion. There's a different</p> <p>13 question as to how investors react to that</p> <p>14 information.</p> <p>15 Q Okay. You're not saying that investors have</p> <p>16 not reacted to fines of less than \$1 billion, are you?</p> <p>17 A That's correct, and I think I say that</p> <p>18 explicitly in my report.</p> <p>19 Q Because what you do in your report is</p> <p>20 determine that any movement less than two standard</p> <p>21 deviations away from the mean is not a substantial</p> <p>22 move, right?</p> <p>23 A I conclude that it was not likely to be</p> <p>24 sufficiently significant for stockholders or</p> <p>25 shareholders to effectively notice the impact of that</p>	<p style="text-align: right;">Page 240</p> <p>1 you found only one fine-related event that resulted in</p> <p>2 a move of that amount or more, right?</p> <p>3 A Effectively, yes. It's a combination of</p> <p>4 several -- it's an announcement date and three</p> <p>5 separate fines that I aggregate, but in broad brush</p> <p>6 strokes, you are correct.</p> <p>7 Q Can you look at paragraph 135 of your</p> <p>8 report, and specifically the continuation that goes</p> <p>9 onto Page 72.</p> <p>10 A Give me a minute.</p> <p>11 Q And I'm only wanting to remind you about</p> <p>12 what you've got down for the standard deviation in</p> <p>13 2008.</p> <p>14 A Correct.</p> <p>15 Q And so in this paragraph, you note that you</p> <p>16 calculated a standard deviation for Google stock in</p> <p>17 2008 of 3.5 percent, right?</p> <p>18 A Correct.</p> <p>19 Q And continuing on in that paragraph, onto</p> <p>20 Page 73, you calculated that one standard deviation in</p> <p>21 that time period equates to a \$5 billion move in</p> <p>22 Google's market cap, right?</p> <p>23 A That's correct.</p> <p>24 Q Given that you were looking for a</p> <p>25 two-standard-deviation stock drop, and the standard</p>
<p style="text-align: right;">Page 239</p> <p>1 event in a way that could cause them to change their</p> <p>2 conduct or just to cause them to put pressure on</p> <p>3 Google management to change its conduct.</p> <p>4 Q Without knowing anything about this case, if</p> <p>5 I asked you to determine how big a fine would need to</p> <p>6 be to move Google's stock down by two standard</p> <p>7 deviations, would you be able to do it?</p> <p>8 MR. COLLIER: Objection; form.</p> <p>9 THE WITNESS: Well, I think that's what I've</p> <p>10 provided in my report.</p> <p>11 (Reporter clarification.)</p> <p>12 THE VIDEOGRAPHER: The time is 4:07 p.m.</p> <p>13 We're off the record.</p> <p>14 (Whereupon, a short recess was taken.)</p> <p>15 THE VIDEOGRAPHER: The time is 4:22 p.m.</p> <p>16 This begins unit number six. We on the record.</p> <p>17 BY MR. DAVIS:</p> <p>18 Q Continuing where we just left off,</p> <p>19 Dr. DeRamus, am I understanding correctly that your</p> <p>20 event study methodology in section 7 looks for events</p> <p>21 that caused at least a two-standard-deviation price</p> <p>22 move after accounting for the fluctuation in the S&amp;P</p> <p>23 500?</p> <p>24 A Yes.</p> <p>25 Q And of the 65 events that you considered,</p>	<p style="text-align: right;">Page 241</p> <p>1 deviation is roughly \$5 billion, is it any surprise</p> <p>2 that the only one you found was the one associated</p> <p>3 with a \$9.5 billion fine?</p> <p>4 A No. It's not a surprise to me that I found</p> <p>5 the results that I did, but given the large value of</p> <p>6 the company, given the things that changed the</p> <p>7 company's stock price on a daily basis, it would need</p> <p>8 to be a substantial amount.</p> <p>9 Q For instance, if, instead of a \$9.5 billion</p> <p>10 fine, it had been a \$4.75 billion fine, you would</p> <p>11 expect to see a one standard deviation move rather</p> <p>12 than a two, right?</p> <p>13 A Approximately, yes.</p> <p>14 MR. DAVIS: I'm going to hand you another</p> <p>15 exhibit. We'll mark it as Exhibit 9.</p> <p>16 (Exhibit 9 was marked for</p> <p>17 identification.)</p> <p>18 BY MR. DAVIS:</p> <p>19 Q Do you have a document, Exhibit 9, in front</p> <p>20 of you with a banner at the top that says "Internet</p> <p>21 Encyclopedia of Philosophy"?</p> <p>22 A I do.</p> <p>23 Q Are you by any chance familiar with that</p> <p>24 source?</p> <p>25 A I am not.</p>

<p style="text-align: right;">Page 242</p> <p>1 Q Okay. Are you familiar with the term</p> <p>2 "fallacy"?</p> <p>3 A Yes, I am.</p> <p>4 Q Do you agree that a fallacy is a kind of</p> <p>5 error in reasoning?</p> <p>6 A Yes.</p> <p>7 Q Do you agree that fallacious reasoning</p> <p>8 should not be persuasive?</p> <p>9 A Yes.</p> <p>10 Q There's a definition here of circular</p> <p>11 reasoning, and it reads, "The fallacy of circular</p> <p>12 reasoning occurs when the reasoner begins with what he</p> <p>13 or she is trying to end up with."</p> <p>14 Did I read that correctly?</p> <p>15 A I, I -- you did read that correctly, yes.</p> <p>16 Q Do you agree with that definition of</p> <p>17 "circular reasoning"?</p> <p>18 A I can see how that could lead to circular</p> <p>19 reasoning. I'm not sure I would express it the same</p> <p>20 way, but this is what this particular source -- how</p> <p>21 this particular source describes it.</p> <p>22 Q Is it, in your view, fallacious reasoning to</p> <p>23 begin with what you are trying to end up with?</p> <p>24 MR. COLLIER: Objection; form.</p> <p>25 THE WITNESS: I'm trying to understand even</p>	<p style="text-align: right;">Page 244</p> <p>1 example of a type of fallacy.</p> <p>2 So typically you would say I observe X.</p> <p>3 That begs the question of whether Y causes X. So</p> <p>4 that's how I've seen it in the past. I've never come</p> <p>5 across it specifically in this context of an example</p> <p>6 of a reasoning fallacy.</p> <p>7 Q Okay. Do you agree that it would be</p> <p>8 fallacious reasoning to arrive at a conclusion derived</p> <p>9 from premises that presuppose the conclusion?</p> <p>10 A I agree with the example that they, that</p> <p>11 they provide here as an example of reasoning that does</p> <p>12 not appear to me to be logical, but I, I would say if</p> <p>13 I have basically an empirical basis to expect a</p> <p>14 particular outcome, I don't know that with certainty.</p> <p>15 I then look to the data to then test that hypothesis.</p> <p>16 I consider that to be perfectly appropriate reasoning.</p> <p>17 Q The example is a colorful one from the</p> <p>18 Bullfighters Association, right?</p> <p>19 A That's correct.</p> <p>20 Q And it says -- the example it gives is "but</p> <p>21 women shouldn't fight bulls, because a bullfighter is</p> <p>22 and should be a man."</p> <p>23 That is indeed circular reasoning, right?</p> <p>24 A Well, it's defining what a bullfighter is.</p> <p>25 It says a bullfighter is a man, and therefore it's</p>
<p style="text-align: right;">Page 243</p> <p>1 the, that concept of beginning with what I'm</p> <p>2 trying to end up with.</p> <p>3 I can see having a prior expectation and</p> <p>4 needing to look at data to identify that is, in</p> <p>5 fact, the case. I would have a prior</p> <p>6 expectation. Look at my data. I can test my</p> <p>7 hypothesis using the data, and that then can tell</p> <p>8 me whether my hypothesis is reasonably supported</p> <p>9 by the data or not.</p> <p>10 So just because I have that prior</p> <p>11 expectation of the results being one way and the</p> <p>12 results confirming my prior expectations does not</p> <p>13 mean that it is a circular argument or circular</p> <p>14 reasoning or fallacious in any way.</p> <p>15 BY MR. DAVIS:</p> <p>16 Q The next definition is of "begging the</p> <p>17 question," and it's defined as "a form of circular</p> <p>18 reasoning in which a conclusion is derived from</p> <p>19 premises that presuppose the conclusion."</p> <p>20 Do you agree with that definition of</p> <p>21 "begging the question"?</p> <p>22 A Give me one second.</p> <p>23 I, I understand the general description</p> <p>24 here, I guess. I use the word "begging the question"</p> <p>25 in a slightly different context as opposed to an</p>	<p style="text-align: right;">Page 245</p> <p>1 just -- it offers that statement, categorical</p> <p>2 statement, "a bullfighter is and should be a man," to</p> <p>3 say that women shouldn't fight bulls, so it's assuming</p> <p>4 the conclusion.</p> <p>5 Q Got it, and that's fallacious reasoning,</p> <p>6 right?</p> <p>7 A I think assuming the conclusion is</p> <p>8 fallacious reasoning, yes.</p> <p>9 Q And if I were to say the optimal penalty in</p> <p>10 this case is one that will produce two standard</p> <p>11 deviations in stock price drop because a penalty</p> <p>12 producing two standard deviations in stock price drop</p> <p>13 is the optimal penalty, that would be assuming the</p> <p>14 conclusion, right?</p> <p>15 MR. COLLIER: Objection; form.</p> <p>16 THE WITNESS: With logical puzzles, I always</p> <p>17 need a moment to kind of parse them through.</p> <p>18 BY MR. DAVIS:</p> <p>19 Q Take your time.</p> <p>20 A I would probably say I would not conclude</p> <p>21 that there is a need for a deterrent penalty amount</p> <p>22 always -- that an appropriate deterrent penalty amount</p> <p>23 should always be an amount that moves the company's</p> <p>24 stock price. Let me put it that way.</p> <p>25</p>

<p style="text-align: right;">Page 246</p> <p>1 Q In this case you have determined that an</p> <p>2 appropriate deterrent penalty amount is one that will</p> <p>3 move Google's stock price by two standard deviation</p> <p>4 net of the S&amp;P 500, true?</p> <p>5 A I have assessed whether -- what is the</p> <p>6 amount that would be necessary to cause a noticeable</p> <p>7 change in Google's stock price, and --</p> <p>8 Q Hang on.</p> <p>9 A -- so I've tried to assess what is the</p> <p>10 amount that would be noticeable by shareholders. So</p> <p>11 not every penalty that's assessed is sufficiently</p> <p>12 large to be noticeable by shareholders, and that, in</p> <p>13 turn, would cause shareholders to address what I</p> <p>14 consider to be this underlying principal-agent</p> <p>15 problem, but I do so within the context of the prior</p> <p>16 analysis. As I said before, I didn't just provide</p> <p>17 section 7 in isolation and say here is the result.</p> <p>18 Q When you say "noticeable by shareholders,"</p> <p>19 you mean an event that moves the stock price by at</p> <p>20 least two standard deviations, right?</p> <p>21 A On an all-in basis, yes.</p> <p>22 Q Okay.</p> <p>23 Are you aware of any research or literature</p> <p>24 indicating that it requires a two-standard-deviation</p> <p>25 stock price drop net of the prevailing market</p>	<p style="text-align: right;">Page 248</p> <p>1 BY MR. DAVIS:</p> <p>2 Q When they're trying to prove causation in</p> <p>3 securities fraud cases, right?</p> <p>4 A As one example.</p> <p>5 MR. COLLIER: Hold on. I didn't know you</p> <p>6 had a new question.</p> <p>7 Objection; form. Go ahead.</p> <p>8 THE WITNESS: As one example, but it's not</p> <p>9 the only way in which economists and financial</p> <p>10 analysts use event studies.</p> <p>11 BY MR. DAVIS:</p> <p>12 Q Please give me another example in which</p> <p>13 economists use a minimum of two standard deviations in</p> <p>14 fluctuation from the mean in connection with event</p> <p>15 studies.</p> <p>16 A Anytime someone is trying to see did Event A</p> <p>17 have a sufficient impact to cause a change in stock</p> <p>18 prices, so whether it's a stock price manipulation or</p> <p>19 whether it is a -- it may be an investigation about a</p> <p>20 different type of conduct. It might be a penalty</p> <p>21 of -- or a fine for asbestos liabilities. There's a</p> <p>22 whole range of things one can think about.</p> <p>23 So, for example, I think recently there was</p> <p>24 a very large fine imposed on a company, and the stock</p> <p>25 price went up, and so the question was why did that</p>
<p style="text-align: right;">Page 247</p> <p>1 fluctuation to be noticeable to shareholders?</p> <p>2 A Well, I can see shareholders knowing about</p> <p>3 a -- a public announcement comes out. It says "Google</p> <p>4 has been fined by a billion dollars," so shareholders</p> <p>5 can notice that. The question is whether there is a</p> <p>6 change in incentive sufficient to deter the conduct at</p> <p>7 issue in this case.</p> <p>8 Q Are you aware of any literature or research</p> <p>9 indicating that it requires a two-standard-deviation</p> <p>10 stock price drop, net of the fluctuating market that</p> <p>11 prevails, to change the incentive of a corporation's</p> <p>12 management?</p> <p>13 MR. COLLIER: Objection; form.</p> <p>14 THE WITNESS: I would say there is a lot of</p> <p>15 literature that focuses on event studies, and</p> <p>16 where looking at a statistically significant</p> <p>17 result requires a change of more than two</p> <p>18 standard deviations to obtain that, that result.</p> <p>19 So whether there's other literature that</p> <p>20 talks about the impact that might have on, on</p> <p>21 shareholder incentives to change management</p> <p>22 behavior, I'd have to think further on that. I</p> <p>23 just know that it is not -- that event study</p> <p>24 analysis does this on a routine basis.</p> <p>25</p>	<p style="text-align: right;">Page 249</p> <p>1 stock price go up as a result, and the inference is</p> <p>2 that the investors had built-in expectations that the</p> <p>3 fine was going to be larger, and so, yay, good news,</p> <p>4 it's a smaller result.</p> <p>5 So that gives you some sense of market</p> <p>6 expectations of what the fine would be, based on the</p> <p>7 information that was previously available.</p> <p>8 Q Two standard deviations is equal to the</p> <p>9 95 percent confidence interval, right?</p> <p>10 A Correct, effectively, yes.</p> <p>11 Q Which is an interval relevant to causation;</p> <p>12 yes?</p> <p>13 MR. COLLIER: Objection; form.</p> <p>14 THE WITNESS: Well, it's a standard level of</p> <p>15 confidence that you use in statistical analysis</p> <p>16 to figure out whether something is having a</p> <p>17 causal impact, correct.</p> <p>18 BY MR. DAVIS:</p> <p>19 Q It is not --</p> <p>20 A I wouldn't say -- I mean calling it a notion</p> <p>21 of causal is maybe a little too strong, but it is a --</p> <p>22 it is part of routine hypothesis testing.</p> <p>23 Q It is not part of routine testing for what</p> <p>24 sorts of stock movement is necessary to incentivize</p> <p>25 shareholders to take action, true?</p>

<p style="text-align: right;">Page 250</p> <p>1 MR. COLLIER: Objection; form.</p> <p>2 THE WITNESS: I think it is reasonable to</p> <p>3 use it in the way I've done, and I think what</p> <p>4 I've done is consistent with the general approach</p> <p>5 to event studies in the economics and finance</p> <p>6 literature.</p> <p>7 BY MR. DAVIS:</p> <p>8 Q Other than you in this case, can you tell me</p> <p>9 a single other person who has used the two standard</p> <p>10 deviation metric to do what you are doing in this</p> <p>11 case?</p> <p>12 A I cannot point to a specific example in</p> <p>13 which someone has done exactly what I've done in this</p> <p>14 case. I can say, though, that, that event study</p> <p>15 analysis is used routinely in assessing stock market</p> <p>16 reactions to particular events.</p> <p>17 Q And in those cases you use the</p> <p>18 two-standard-deviation metric to determine whether an</p> <p>19 event, in fact, caused change in the stock price; yes?</p> <p>20 MR. COLLIER: Objection; form.</p> <p>21 THE WITNESS: Or that it was sufficiently</p> <p>22 large to be detectable by the market. Otherwise,</p> <p>23 it's just noise.</p> <p>24 BY MR. DAVIS:</p> <p>25 Q You mean sufficiently large to be attributed</p>	<p style="text-align: right;">Page 252</p> <p>1 you have data to see how the stock price has</p> <p>2 reacted in the past to those, to those fines, you</p> <p>3 can see whether even a small fine may have</p> <p>4 actually had a significant impact on the</p> <p>5 company's stock price.</p> <p>6 So, for example, a company with a relatively</p> <p>7 small market capitalization and very thin</p> <p>8 margins, a small penalty may be sufficient to</p> <p>9 move the stock price outside of the random noise,</p> <p>10 and particularly it's a -- if you call it a</p> <p>11 very low growth company, there's not a lot of</p> <p>12 variation in its stock price on a day-to-day</p> <p>13 basis.</p> <p>14 So it will depend on the company that</p> <p>15 both -- whether a given fine of a given size has</p> <p>16 an effect sufficient to cause shareholders to</p> <p>17 effectively sit up and notice in a measurable</p> <p>18 way, it will depend on a lot of variables</p> <p>19 associated with that particular company.</p> <p>20 BY MR. DAVIS:</p> <p>21 Q How did you determine that it takes two</p> <p>22 standard deviations of stock price drop net of the S&amp;P</p> <p>23 500 for shareholders to take notice?</p> <p>24 MR. COLLIER: Objection; form.</p> <p>25 THE WITNESS: Well, that's what I consider</p>
<p style="text-align: right;">Page 251</p> <p>1 to a given hypothesized cause, don't you?</p> <p>2 A Effectively, yes.</p> <p>3 Q Okay, which is not how you are using the</p> <p>4 two-standard-deviation metric in this case, true?</p> <p>5 MR. COLLIER: Objection; form.</p> <p>6 THE WITNESS: No. Maybe I misunderstood the</p> <p>7 thread of your questioning, but I am using the</p> <p>8 two-standard-deviation measure here to assess</p> <p>9 whether announcement of a given penalty was</p> <p>10 sufficiently large for the market to react</p> <p>11 negatively to that particular news.</p> <p>12 BY MR. DAVIS:</p> <p>13 Q Is it your belief that the market -- well,</p> <p>14 I'll stop. I'll go back.</p> <p>15 Can I start a new question?</p> <p>16 A Yes.</p> <p>17 Q If you want to determine what sort of fine</p> <p>18 will have a two-standard-deviation impact on any</p> <p>19 publicly traded company, you can calculate that right</p> <p>20 now, can't you?</p> <p>21 MR. COLLIER: Objection; form.</p> <p>22 THE WITNESS: You can calculate for any</p> <p>23 specific company, depending on its size, its</p> <p>24 market capitalization, the standard deviations,</p> <p>25 daily returns, and particularly if you can -- if</p>	<p style="text-align: right;">Page 253</p> <p>1 to be a standard way of doing confidence interval</p> <p>2 testing to establish a confidence interval, a</p> <p>3 95 percent confidence interval, and to establish</p> <p>4 whether the changes in the stock price at that</p> <p>5 particular event were so large that they would</p> <p>6 have been considered by the public as not simply</p> <p>7 something reacting to noise.</p> <p>8 BY MR. DAVIS:</p> <p>9 Q And this is a slight variation on a similar</p> <p>10 question, so I hope you don't think I'm badgering you,</p> <p>11 but is there anything written down, in your view, that</p> <p>12 actually says that for shareholders to sit up and take</p> <p>13 action, there needs to be at least a</p> <p>14 two-standard-deviation drop in the stock price?</p> <p>15 A No. I think I said before, there are</p> <p>16 certain conduct that I could see shareholders knowing</p> <p>17 about and taking action on that didn't require that.</p> <p>18 In this case, I do think it is one that requires a</p> <p>19 penalty of that magnitude, particularly given the rest</p> <p>20 of the information that I've analyzed.</p> <p>21 Q If -- using the analysis that you perform in</p> <p>22 section 7, if you were assessing penalties only for</p> <p>23 RPO and not for DRS or Bernanke, your section 7</p> <p>24 methodology would arrive at the same conclusion, true?</p> <p>25 A Well, the section 7 methodology is --</p>



<p style="text-align: right;">Page 254</p> <p>1 there's no -- I have not tried to adjust that for a  2 conduct-by-conduct analysis. So it's not, it's not  3 derived from this conduct. It's derived from Google  4 stock price, the reaction of Google stock price to  5 prior penalties.  6 So it would require perhaps a comparison of  7 what the RPO-only benefits were from the prior, the  8 prior sections, and assessing the extent to which that  9 conduct was expected to provide long-term financial  10 benefits to Google; back to this issue of  11 proportionality, to determine whether a fine of that  12 magnitude would be commensurate -- in general,  13 commensurate with an RPO-only finding, for example.  14 Q And how do you determine whether it's  15 proportional or commensurate?  16 A Well, I just -- I went through the analysis  17 in my section 6. My section 6 provides a pretty broad  18 range of, of potential deterrent penalty amounts, and  19 those numbers are generally in excess of the amount  20 derived from the stock price analysis.  21 So it would be reasonable, if the jury were  22 to find a lesser range of conduct than is analyzed in  23 the first part of my analysis, to award something in  24 the range of what I propose in the, in section 7, but  25 again that's ultimately a jury determination. From an</p>	<p style="text-align: right;">Page 256</p> <p>1 section 7.  2 Section 7 provides an alternative approach  3 for the jury to consider or disregard that I  4 still think, from an economic perspective,  5 provides an indication of the order of magnitude,  6 more than an order of magnitude, but a reasonable  7 range for the jury to award, if it determines  8 that the conduct is significant and as extensive  9 as described in the earlier sections of my  10 report.  11 If the jury were to conclude that severity  12 was significantly less than as I describe, then  13 the jury is always free to either disregard it or  14 to adjust it accordingly.  15 BY MR. DAVIS:  16 Q How would I use the event study methodology  17 you use in section 7 to calculate an optimal deterrent  18 fine for some sort of wrongdoing causing only  19 \$1 million in harm?  20 MR. COLLIER: Objection; form.  21 THE WITNESS: In that situation, I wouldn't  22 use it.  23 BY MR. DAVIS:  24 Q So the section 7 analysis is only capable of  25 arriving at very large fines; true?</p>
<p style="text-align: right;">Page 255</p> <p>1 economic perspective, I would consider that to be a  2 reasonable approach to take.  3 Q Okay. So you would consider it reasonable  4 for the jury to assess penalties based on your section  5 7 analysis, whether they find all three of Bernanke,  6 RPO and DRS to have been unlawful, or just two of the  7 three; fair?  8 A Maybe I'd phrase it slightly differently. I  9 would say as an economist, I think it would be  10 reasonable to apply the damages that I derive in  11 section 7, even if the jury were to determine the  12 range of actionable conduct or that the actual legal  13 violations were less than the conduct that I'm  14 evaluating in the -- in section 6.  15 Q Okay. The analysis in section 7 is divorced  16 from the conduct at issue in this case, other than  17 with respect to your desire to make sure that the  18 section 7 result is proportional to the section 6  19 result; fair?  20 MR. COLLIER: Objection; form.  21 THE WITNESS: I wouldn't say divorced from.  22 I would say it is not -- I do not -- as I said  23 probably an hour ago, I don't use as inputs a  24 measure of the direct benefits to Google of the  25 conduct at issue in deriving the numbers in</p>	<p style="text-align: right;">Page 257</p> <p>1 A It tells me what kind of -- or it tells me,  2 as an economist, what is the magnitude of a financial  3 penalty that would be sufficient to change fairly  4 substantial conduct of the company that is otherwise  5 highly profitable for the company, and that otherwise  6 contributes to the growth of the company's stock  7 price.  8 Q And if I say the sentence "the optimal  9 penalty is \$25 billion, because that is the minimum  10 penalty that will cause two standard deviations in  11 stock price drop," aren't I begging the question?  12 MR. COLLIER: Objection; form.  13 THE WITNESS: If the only thing you said was  14 you did no evaluation, you did no evaluation of  15 the, of the conduct, of the scope of conduct, of  16 the likely benefits, the likely economic impact  17 of that conduct, and you just said \$25 billion is  18 the number, I would say you have not done  19 sufficient analysis to determine that that is, in  20 fact, an appropriate penalty amount to apply in  21 this particular case.  22 BY MR. DAVIS:  23 Q And to be clear, if all I said was  24 \$25 billion is the number because it will cause two  25 standard deviations of drop in Google stock price net</p>



<p style="text-align: right;">Page 258</p> <p>1 of the S&amp;P 500, same problem; yeah?</p> <p>2 MR. COLLIER: Objection; form.</p> <p>3 THE WITNESS: Well, again, I probably --</p> <p>4 maybe I'm missing the thrust of your</p> <p>5 clarification or follow-up question, but the</p> <p>6 bottom line is I would not be offering an opinion</p> <p>7 in this matter without knowing anything about the</p> <p>8 conduct, about the scope of the conduct, the</p> <p>9 volume of commerce affected, the number of</p> <p>10 transactions, Google's market position, so on and</p> <p>11 so forth. I would not be offering an opinion,</p> <p>12 just say here is an analysis of a stock price,</p> <p>13 and therefore suggesting to the jury that that</p> <p>14 would be an economically reasonable amount to</p> <p>15 apply.</p> <p>16 I wouldn't say that if a Google employee had</p> <p>17 a speeding ticket and, and I did not know it was</p> <p>18 a speeding ticket; all I knew was that someone at</p> <p>19 Google did something; therefore, there's a</p> <p>20 penalty at issue; I wouldn't say, oh, here is an</p> <p>21 analysis and apply this number.</p> <p>22 BY MR. DAVIS:</p> <p>23 Q Can you point me to where in your report you</p> <p>24 explain why you think a two-standard-deviation</p> <p>25 threshold is a reasonable threshold for determining</p>	<p style="text-align: right;">Page 260</p> <p>1 to the penalties announced on the event days.</p> <p>2 Therefore, the analysis indicates that these</p> <p>3 prior penalties have had a minimal impact on</p> <p>4 Google's stock performance, providing little</p> <p>5 incentive for shareholders to actively engage in</p> <p>6 monitoring and deterring corporate misconduct.</p> <p>7 BY MR. DAVIS:</p> <p>8 Q And that result was foreordained, because</p> <p>9 the only penalty that you consider that's \$1 billion</p> <p>10 or above is the \$9.5 billion aggregate penalty from</p> <p>11 the EU in 2017 to 2019, right?</p> <p>12 A It's not foreordained. There are certain</p> <p>13 results that may be expected once you get some of the</p> <p>14 basic data, once you -- so going into it, I have no</p> <p>15 idea, maybe the standard deviation of their stock</p> <p>16 returns is very, very tight, in which case -- and</p> <p>17 maybe in the imposition of a prior penalty of</p> <p>18 \$5 billion, maybe there was a significant impact on</p> <p>19 the price in that given day.</p> <p>20 I looked to the data, and the data tell me</p> <p>21 no, it's not, and I, I -- one would have reason to</p> <p>22 expect -- on an ex ante basis, one would have reason</p> <p>23 to hypothesize that, given the size of Google's market</p> <p>24 capitalization, one would need a relatively</p> <p>25 substantial penalty to have such an effect, but you</p>
<p style="text-align: right;">Page 259</p> <p>1 whether a penalty is sufficient?</p> <p>2 MR. COLLIER: Objection; form.</p> <p>3 THE WITNESS: Give me a moment.</p> <p>4 (Witness peruses document.)</p> <p>5 THE WITNESS: Okay. So just to orient us</p> <p>6 where I am with section 7, so section 7, all my</p> <p>7 reports are response to Dr. Wiggins and</p> <p>8 Dr. Skinner. Dr. Wiggins and -- both Dr. Wiggins</p> <p>9 and Dr. Skinner say all this information about</p> <p>10 prior penalties is irrelevant.</p> <p>11 I say in my section 7, no, no, no, it's</p> <p>12 highly relevant, but in particular because of the</p> <p>13 other principal-agent literature that I described</p> <p>14 before.</p> <p>15 So I go through and I examine that. I do</p> <p>16 this event study, and then in paragraph 137, and</p> <p>17 I say that -- I don't know if you want me to read</p> <p>18 that entire paragraph in, but it talks about the</p> <p>19 fluctuations of just the stock returns, remaining</p> <p>20 within -- mostly remaining within one standard</p> <p>21 deviation of the average, and mostly contained</p> <p>22 within two standard deviations.</p> <p>23 And maybe the crux of it is this consistent</p> <p>24 pattern indicates that the stock returns do not</p> <p>25 experience additional significant volatility due</p>	<p style="text-align: right;">Page 261</p> <p>1 would still need to look at the data to test what is</p> <p>2 that amount, and that's what I use.</p> <p>3 That's why I ultimately determined that this</p> <p>4 method would suggest that \$12 billion on a current</p> <p>5 dollar value as of 2025 would be a floor for a</p> <p>6 deterrent penalty amount.</p> <p>7 Q And just for the record, the place in your</p> <p>8 report where you explain why to use a</p> <p>9 two-standard-deviation threshold is paragraph 137?</p> <p>10 That's what you were just reading from?</p> <p>11 A That's the one I was first reading from. I</p> <p>12 would have to go back and see if there are other</p> <p>13 places that I talk about that, but I, I say that also</p> <p>14 in paragraph 139 and other places in the report.</p> <p>15 Q Is there any important explanation for why</p> <p>16 two standard deviations is correct that is not in</p> <p>17 paragraph 137?</p> <p>18 MR. COLLIER: Objection; form.</p> <p>19 THE WITNESS: Well, big picture, I'm looking</p> <p>20 for an observable impact. I'm looking for a</p> <p>21 large enough penalty in expectation, in aggregate</p> <p>22 that is enough to move the stock price in a way</p> <p>23 that is statistically significant.</p> <p>24 BY MR. DAVIS:</p> <p>25 Q There are -- in your section 7, there are</p>

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1 two points where you notice other unusual fluctuations  
2 in Google's stock price on event days, but determined  
3 that they were not the result of fines, right?  
4 A Correct.  
5 Q And my understanding is that you did some  
6 research to see whether there may be other more likely  
7 causes on those dates, right?  
8 A That's correct.  
9 Q Did you do that same research for  
10 November 30, 2010?  
11 MR. COLLIER: Objection; form.  
12 THE WITNESS: I did do some research about  
13 that on the 2010 date, yes.  
14 BY MR. DAVIS:  
15 Q Did you learn whether there were any  
16 confounding circumstances with respect to Google's  
17 stock price on November 30, 2010?  
18 A I did not. I did not, or I don't recall  
19 them being such. I recall the references or  
20 expectations that those -- that drop in stock price  
21 was a result or a reflection of the investigation.  
22 Q Do you know whether that investigation was  
23 announced already back in February of 2010?  
24 A As I sit here today, I do not know.  
25 Q Would that be relevant to your analysis?

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1 A I would take that into consideration. I  
2 would want to know when it was first -- when that  
3 information was first made public, and I would want to  
4 factor that into my analysis.  
5 Q If Google announced its largest ever  
6 acquisition on November 30, 2010, would that be a  
7 confounding circumstance?  
8 A It would be a factor that I would want to  
9 analyze further.  
10 Q And just for the record, November 30, 2010  
11 is the event day that you associate with the nearly  
12 four percent stock drop associated with the  
13 announcement of the EU antitrust investigation, right?  
14 A That's correct.  
15 MR. DAVIS: I'll show what we'll mark as  
16 Exhibit 10.  
17 (Exhibit 10 was marked for  
18 identification.)  
19 BY MR. DAVIS:  
20 Q And just let me know when you've had a  
21 chance to peruse Exhibit 10.  
22 (Witness peruses document.)  
23 THE WITNESS: Okay. I haven't read it in  
24 its entirety, but give me one second.  
25 (Witness peruses document further.)

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1 THE REPORTER: Okay, thank you.  
2 BY MR. DAVIS:  
3 Q Exhibit 10 is a Reuters article dated  
4 November 30, 2010, right?  
5 A It is.  
6 Q And it's about Google being reportedly close  
7 to closing on a deal to buy Groupon, right?  
8 A That's correct.  
9 Q Do you remember Groupon?  
10 A Yes, I do.  
11 Q Me, too. I don't know what happened to  
12 them, but it says that the information that had been  
13 released was that Google was going to pay \$6 billion  
14 for Groupon, right?  
15 A Correct.  
16 Q And this information is coming out the same  
17 day that you assessed a stock drop to the announcement  
18 of the EU antitrust investigation, right?  
19 A That's what it appears to be, yes.  
20 Q And the third paragraph says "Google's  
21 shares fell 4.5 percent, partly on concern it may  
22 shell out too much for a business likely to face  
23 increasing competition," right?  
24 A That's correct.  
25 Q Then there's an analyst quoted as saying

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1 "investors think that might be overpaying," right?  
2 A That's what that analyst says, yes.  
3 Q Fair to say that this is an event that you  
4 should have addressed before ascribing the entire  
5 stock drop to the EU announcement of an antitrust  
6 investigation?  
7 MR. COLLIER: Objection; form.  
8 THE WITNESS: Well, I would say it may  
9 indicate that I am underestimating the amount of  
10 a penalty that would be necessary to cause a  
11 price drop, that if -- a lot of it depends on how  
12 much weight to put on this particular article and  
13 this particular analyst statement, but if some  
14 fraction of the share price decline was caused by  
15 the penalty -- or the investigation, rather --  
16 and an additional portion of the stock price  
17 decline was attributable to fears of overpaying,  
18 then that would suggest that a higher amount than  
19 I've derived in my amount would be necessary to  
20 cause that noticeable impact on Google's share  
21 price.  
22 BY MR. DAVIS:  
23 Q Except that the amount from the  
24 investigation would make the stock drop too little to  
25 hit the two-standard-deviation threshold, wouldn't it?

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1 A That's right, which would suggest that there  
2 has not been a penalty sufficiently large, even in  
3 those aggregate three penalties that I use to derive  
4 this section of my report, that would suggest that  
5 that is a -- the amount should be greater than that,  
6 not less than that.  
7 Q Go ahead.  
8 A Well, I'm sorry. I lost my train of  
9 thought.  
10 Q The only numerical foundation for your  
11 results in section 7 is the stock drop from  
12 November 30, 2010; true?  
13 A Well, it's the only one -- and again, it's  
14 combined across both the announcement date and the  
15 penalty dates, so the only way I get the significant  
16 result is by combining announcement date and  
17 actually -- sorry -- announcement date of the  
18 investigations and then ultimately penalty dates  
19 imposed later on.  
20 And absent that, that would indicate that a  
21 fine in excess of \$9 billion nominal terms, an excess  
22 of --  
23 Q Totally?  
24 A -- \$12 billion would be necessary in order  
25 to cause investors to -- or shareholders to have

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1 sufficient incentive to --  
2 Q Totally?  
3 A -- discipline managers for the type of  
4 conduct here.  
5 Q And similarly, if we went through all the  
6 other stock drops that didn't hit your  
7 two-standard-deviation threshold and tried to account  
8 for other causes compared to the fines, your results  
9 might change on those days, too, right?  
10 MR. COLLIER: Objection; form.  
11 THE WITNESS: Well, if there are other  
12 confounding factors associated with any days, I  
13 would want to look at those confounding factors  
14 in order to assess whether the impact was --  
15 whether the stock changed on those dates were  
16 associated with those confounding factors or with  
17 the announced penalty dates.  
18 I would say the, the -- ultimately, the  
19 directionality of your criticism basically says  
20 that my \$9 billion or \$12 million minimum amount  
21 under this method is too low, which I still think  
22 is a relevant data point for the jury to have in  
23 terms of how big does a penalty need to be, given  
24 Google's stock price size -- or sorry -- given  
25 Google's market capitalization, in order to cause

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1 the shareholders to induce a significant change  
2 in management conduct for conduct that is  
3 otherwise highly profitable for the company and  
4 for shareholders.  
5 BY MR. DAVIS:  
6 Q So I want to be clear. Assuming that the  
7 article in Exhibit 10 is right, your results in  
8 section 7 are wrong, right?  
9 MR. COLLIER: Objection; form.  
10 THE WITNESS: No. I still think the -- the  
11 results would be that the \$12 billion present  
12 value floor that I have, it would be a floor,  
13 right? It would be -- actually, even that would  
14 indicate that the penalty amount should be  
15 greater than \$12 billion. At \$12 billion, an  
16 expectation would have no meaningful impact or  
17 sufficiently large impact on Google's stock price  
18 to cause a change in Google's conduct in the  
19 future -- to deter similar conduct by Google or  
20 other parties in the future.  
21 BY MR. DAVIS:  
22 Q And we would be left with no relevant  
23 metric, according to you, for what sort of fine would  
24 cause that kind of a stock drop, right?  
25 A Well, you, you would then have a floor. A

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1 very confident level without a floor, you would say  
2 definitely needs to be north of \$12 billion.  
3 Q Isn't the more likely explanation that none  
4 of your event days were the days on which fines or the  
5 expectation of fines were baked into Google's stock  
6 price?  
7 MR. COLLIER: Objection; form.  
8 THE WITNESS: No. I think, as you pointed  
9 out early on, that there is a significant daily  
10 volatility associated with their stock price,  
11 that the -- given the size of Google's market  
12 capitalization, one would need a very substantial  
13 penalty relative to the prior penalties that were  
14 imposed in order to have a meaningful impact on  
15 the stock price.  
16 BY MR. DAVIS:  
17 Q With "meaningful" defined as a  
18 two-standard-deviation move, right?  
19 A Correct. As a -- well, I would say it maybe  
20 a little bit more completely, but "meaningful" meaning  
21 detectable from a statistical perspective, relative to  
22 all of the other factors that affect the price of  
23 Google on any given day.  
24 Q But you were able to detect the impact of a  
25 fine way back from November 30, 2010, I thought.

<p style="text-align: right;">Page 270</p> <p>1 MR. COLLIER: Objection; form.</p> <p>2 THE WITNESS: I was only able to do so as a</p> <p>3 result of combining the event days across all the</p> <p>4 different time periods and, and comparing the</p> <p>5 stock returns, those combined stock returns</p> <p>6 relative to the standard deviation of, of</p> <p>7 Google's stock returns, in order to then assess</p> <p>8 is this a statistically significant factor, does</p> <p>9 it cause a statistically significant change in</p> <p>10 the price of Google's stock price, and that's why</p> <p>11 I consider it a floor and not a cap.</p> <p>12 BY MR. DAVIS:</p> <p>13 Q Gotcha.</p> <p>14 A Nor do I say \$12 billion is the number, full</p> <p>15 stop.</p> <p>16 Q Because that would be silly, right?</p> <p>17 MR. COLLIER: Objection; form.</p> <p>18 THE WITNESS: No, because I believe it to</p> <p>19 provide an indication of the minimum fine,</p> <p>20 penalty that needs to be applied in order to</p> <p>21 cause a change in conduct related to otherwise</p> <p>22 highly profitable conduct for Google.</p> <p>23 BY MR. DAVIS:</p> <p>24 Q By which you mean sufficient to cause a</p> <p>25 two-standard-deviation stock drop?</p>	<p style="text-align: right;">Page 272</p> <p>1 described in my report that I -- that would be my</p> <p>2 expectation in terms of a -- as a valuation</p> <p>3 practitioner, that's what I would expect.</p> <p>4 The question is whether that is observable</p> <p>5 by the market and sufficiently impactful as</p> <p>6 compared to, for example, conduct that the</p> <p>7 company -- the stockholders would consider, hey,</p> <p>8 okay, we got tagged by this anticompetitive</p> <p>9 conduct or deceptive conduct, and -- but we're</p> <p>10 still ahead of the game, so yes, continue on.</p> <p>11 BY MR. DAVIS:</p> <p>12 Q And so you can actually cause the section 7</p> <p>13 methodology to come out however you want by defining</p> <p>14 what a sufficient stock drop to cause shareholder</p> <p>15 action is; true?</p> <p>16 MR. COLLIER: Objection; form.</p> <p>17 THE WITNESS: No.</p> <p>18 BY MR. DAVIS:</p> <p>19 Q Well, if I believe that half of a standard</p> <p>20 deviation stock drop is sufficient to cause this</p> <p>21 shareholder monitoring you're talking about, and I</p> <p>22 convince you of that, then section 7 comes out at</p> <p>23 25 percent of the current value it comes out to; yes?</p> <p>24 A There's no statistical basis for that. It's</p> <p>25 not, it's not observable by -- relative to the</p>
<p style="text-align: right;">Page 271</p> <p>1 MR. COLLIER: Objection; form.</p> <p>2 THE WITNESS: By which I mean sufficient to</p> <p>3 cause shareholders to appreciate the magnitude of</p> <p>4 that drop and realize that the conduct is not --</p> <p>5 and to deter, disincentivize management in the</p> <p>6 future from making that trade-off.</p> <p>7 BY MR. DAVIS:</p> <p>8 Q And you have defined that point as a</p> <p>9 two-standard-deviation stock drop; yes?</p> <p>10 A I have defined the detectable -- the point</p> <p>11 at which it's detectable relative to all the other</p> <p>12 factors, the noise that happens with stock prices.</p> <p>13 Q Holding everything else equal, if there's a</p> <p>14 \$2 billion fine imposed on Google tomorrow, we would</p> <p>15 expect Google's market cap to go down \$2 billion; yes?</p> <p>16 MR. COLLIER: Objection; form.</p> <p>17 THE WITNESS: As an economist, I expect the</p> <p>18 value of the company to go down by \$2 billion, as</p> <p>19 the -- thinking of the value of the company as,</p> <p>20 as the net present value of the future cash</p> <p>21 flows.</p> <p>22 So if you take those future cash flows,</p> <p>23 deduct \$2 billion, then you would expect the</p> <p>24 value of the company to go down by that amount.</p> <p>25 There's a separate question, and that's why it's</p>	<p style="text-align: right;">Page 273</p> <p>1 noise --</p> <p>2 Q Right.</p> <p>3 A -- in the stock price.</p> <p>4 Q And there's no research whatsoever</p> <p>5 indicating what degree of a stock drop causes</p> <p>6 shareholders to take action, is there?</p> <p>7 MR. COLLIER: Objection; form.</p> <p>8 THE WITNESS: There's lots of research in</p> <p>9 the application of event studies to stock prices,</p> <p>10 where the standard measure is going to be whether</p> <p>11 the event caused a statistically significant</p> <p>12 change in the stock price, so something typically</p> <p>13 defined, based on two standard deviations or</p> <p>14 based on a 95 percent confidence interval,</p> <p>15 however the econometrician set up their event</p> <p>16 study model.</p> <p>17 BY MR. DAVIS:</p> <p>18 Q Do you think that if Google comes out below</p> <p>19 earnings expectations and drops by one percent, that</p> <p>20 investors aren't obviously to attribute that drop to</p> <p>21 the earnings announcement?</p> <p>22 MR. COLLIER: Objection; form.</p> <p>23 THE WITNESS: It would, it would depend on</p> <p>24 the event, right? It -- if there was a</p> <p>25 particular change on a particular day where it</p>

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1 dropped, and the other issue is whether an  
2 analyst simply ascribes it or whether, in fact,  
3 that is outside of the bounds; i.e., that's what  
4 somebody who does statistics, what they are  
5 charged with is; is that event, in fact,  
6 ascertainable with some degree of reliability to  
7 that particular event, or is it simply a random  
8 fluctuation? Did the analyst get lucky; i.e., a  
9 negative news comes out, there's a one percent  
10 decline in that -- in the stock price. It turns  
11 out the S&P 500 also declined by one percent on  
12 that day, and then it's just that analyst's  
13 statement about it, but it is not necessarily  
14 something that is a statistically verifiable  
15 test.  
16 BY MR. DAVIS:  
17 Q Would it surprise you to learn that over the  
18 last several months, analysts have determined that  
19 investors have started to price in the result of the  
20 Virginia trial into Google's stock price?  
21 MR. COLLIER: Objection; form.  
22 THE WITNESS: It would not surprise me that  
23 there are expectations of the Virginia trial  
24 being factored into the future stock price. I  
25 think -- yeah, I'll leave it at that.

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1 BY MR. DAVIS:  
2 Q And for us to ascribe -- let me start over.  
3 For us to subscribe to your results in  
4 section 7, we have to believe that investors in 2010  
5 relatively accurately predicted the fines that would  
6 be imposed as a result of an investigation that did  
7 not result in fines until 2017, 2018 and 2019  
8 respectively; yes?  
9 MR. COLLIER: Objection; form.  
10 THE WITNESS: That's why I combine the  
11 returns on all those days, both the announcement  
12 dates and on the fine dates.  
13 BY MR. DAVIS:  
14 Q The returns on the other dates were  
15 positive, right?  
16 A I would have to go back and look. Some  
17 positive -- I believe some were positive and some were  
18 negative. I just don't recall exactly which ones.  
19 Q Please go ahead and look. I believe it is  
20 paragraph 140, which indicates that Google stock  
21 dropped by 3.9 percent on the November 30, 2010 date,  
22 and that across all of the dates, the aggregate is  
23 just negative 3.8 percent.  
24 And so the other dates were a positive  
25 influence on the November 2010 date; yes?

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1 MR. COLLIER: Objection; form.  
2 THE WITNESS: On aggregate, but there would  
3 have been some that may have been positive and  
4 some that may have been negative. I just don't  
5 recall.  
6 THE REPORTER: Slow down. "There would have  
7 been some that would have been" --  
8 THE WITNESS: Positive. There's some that  
9 may have been positive, there's some that may  
10 have been negative. Here you're just -- I'm just  
11 referring to the sum.  
12 BY MR. DAVIS:  
13 Q As of November 2010, what was the largest  
14 fine that the EU had ever imposed in a competition  
15 matter?  
16 A I don't recall, but it was -- well, I'll  
17 just say I don't recall.  
18 Q Can you --  
19 A I don't know. As I sit here today, I don't  
20 know. It may be in some of these documents, in some  
21 of the, some of the . . .  
22 Q Five point something million of the  
23 \$9.5 million aggregate comes from Android, right?  
24 MR. COLLIER: Objection; form.  
25 THE WITNESS: I believe you mean billion.

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1 BY MR. DAVIS:  
2 Q Oh. Can I ask a new question?  
3 A Sure.  
4 Q Over five billion of the three fines that  
5 total \$9.5 billion was a fine in connection with  
6 Google's Android product, correct?  
7 A Give me a second. That generally is  
8 consistent with my recollection, but let me -- if you  
9 can point me to the specific paragraph where I talk  
10 about that one, that might make things faster.  
11 Q Page 76, note 250.  
12 A Thank you. Note 250 doesn't say how much is  
13 for each of the fines.  
14 THE REPORTER: Note 50?  
15 THE WITNESS: Note 250. I believe it's in  
16 the earlier section of my report. Here we go.  
17 Page 69. I'm at the top.  
18 Correct. \$5.1 billion was the fine for  
19 Google having found to have used the Android  
20 mobile operating system to effectively funnel  
21 users toward Google's search engine.  
22 BY MR. DAVIS:  
23 Q And so that's the majority of the 9.5,  
24 right?  
25 A Correct.



<p style="text-align: right;">Page 278</p> <p>1 Q Were investors in 2010 able to foresee a 2 fine by the EU in connection with Android? 3 A Well, that's where I -- I believe the short 4 answer is no. So I would say that there are -- those 5 are reasons why I analyze the returns on each of the 6 five days, and I add all the returns across those five 7 days, the two announcement dates and the 8 investigations, and then the three, the three penalty 9 dates. 10 Q If your analysis determines that a 11 fine-related event has never moved Google's stock 12 price more than two standard deviations, isn't that 13 consistent with the possibility that fines get baked 14 into stock price over periods longer than ten days? 15 MR. COLLIER: Objection; form. 16 THE WITNESS: If they were, then it would 17 suggest that it's not a strong enough signal to 18 cause a change in, in the conduct of the, of the 19 company. 20 BY MR. DAVIS: 21 Q Or in the stock price of the company, right? 22 A Well, in the stock price and the conduct, 23 that it would -- so let me put it a slightly different 24 way. 25 If I am a manager, and I can increase my</p>	<p style="text-align: right;">Page 280</p> <p>1 price at a later time period, so that would have 2 been additional information. 3 Here, I'm looking at what is the empirical 4 basis to ascertain whether a \$9 billion fine in 5 nominal terms is sufficient to elicit this 6 shareholder reaction, and that's where I thought 7 the analysis that I did is sufficient to come to 8 that conclusion. 9 Now, I haven't looked at the stock price 10 reaction when the EU reversed that decision, so 11 it may be that the number I have is too small, 12 that maybe you do need a number bigger than 13 \$9 billion in nominal terms or \$12 billion in 14 present value terms. 15 I still could consider that to be a relevant 16 data point for the jury to consider in 17 assessing -- or I should say I consider it a 18 relevant data point from an economic perspective, 19 in assessing what is a reasonable amount of a 20 deterrent penalty amount, consistent with 21 economic principles and consistent with the 22 broader course of conduct described in my report 23 to be applied in this case. 24 BY MR. DAVIS: 25 Q Don't investors make projections about</p>
<p style="text-align: right;">Page 279</p> <p>1 bonus by a million dollars by engaging in conduct that 2 shareholders are never going to tag me with, because 3 the share price is so high, and it keeps rising so 4 much, or it's volatile for other reasons, then I, as a 5 manager, would have an incentive to engage in that 6 otherwise actionable conduct, particularly if the 7 manager is not otherwise subject to prosecution or 8 other kinds of liability. 9 Q How does it affect your analysis, if at all, 10 that in between one and two billion of the 11 \$9.5 billion fines has since been reversed? 12 MR. COLLIER: Objection; form. 13 THE WITNESS: In the grand scheme of things, 14 it doesn't really, because I'm looking at the 15 stock price change on those earlier dates, and 16 I'm aggregating across those dates to see, is 17 that information -- well, once that information 18 is out there in the market about the 19 investigation and the ultimate fines, is there 20 any indication that the magnitude -- particularly 21 the expected fines. It could have been too low, 22 for example. 23 The EU could have come up and said, you 24 know, a thousand dollars per violation, and then 25 we could have observed an increase in the stock</p>	<p style="text-align: right;">Page 281</p> <p>1 likely outcomes of enforcement proceedings while those 2 proceedings are ongoing? 3 A Yes, I would expect investors to make those 4 projections. 5 Q Don't they make projections about likely 6 enforcement proceedings before those proceedings are 7 formally announced? 8 MR. COLLIER: Objection; form. 9 THE WITNESS: They may make that assessment, 10 yes. 11 BY MR. DAVIS: 12 Q For instance, when President Biden won 13 the -- not for much longer -- most recent election, 14 didn't the expected vector of his antitrust policy 15 affect certain companies' stock prices? 16 MR. COLLIER: Objection; form. 17 THE WITNESS: I don't recall. I recall 18 there being concerns about antitrust enforcement, 19 or I should say fairly significant antitrust 20 enforcement actions preceding the Biden 21 administration, but I don't recall whether there 22 was a change in stock market reactions, for 23 example, for companies then under investigation 24 or even not under investigation, because of a 25 concern about additional antitrust enforcement</p>



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1 actions.

2 BY MR. DAVIS:

3 Q What analysis have you done to determine

4 that the market, relatively accurately, prices in

5 eventual fine amounts on the date that enforcement

6 actions are formally announced?

7 A That is the question I'm trying to answer.

8 Is there an announcement, and is the announcement of

9 an investigation associated with conduct or in

10 potential outcome that the markets consider to be so

11 large as to actually move the price, and that's also

12 the reason why, in the context of fines, I want to

13 look at both the announcement date and the actual fine

14 imposition date.

15 Q I think my question was different.

16 What analysis have you done or research have

17 you read that indicates to you that the announcement

18 date of an enforcement action is a date on which the

19 market, relatively accurately, prices in the

20 expected -- excuse me -- the actual outcome of that

21 enforcement action?

22 MR. COLLIER: Objection; form.

23 THE WITNESS: I think that is the question

24 and one of the -- so let me put it differently.

25 I look at the announcement date, because the

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1 amount of the stock price reaction on the penalty

2 announcement date may not reflect information

3 that's already baked into the stock price. So

4 let's assume that the market expects a \$5 billion

5 fine for a violation -- for an investigation that

6 commences five years earlier, and already

7 effectively punishes the company's stock price on

8 the date of the announcement, and then when the

9 fine is actually announced at \$5 billion, then

10 you observe no change in the price.

11 And in that regard, I am attributing the

12 the \$5 billion -- if I observe a statistically

13 significant drop in the combined returns across

14 the two days, then I am concluding that the, the

15 fine effectively was, was noticeable.

16 So I am actually helping to show that there

17 are certain fines at a certain level that begin

18 to be impacted. The alternative approach --

19 i.e., just focusing on the fine announcement

20 date -- might not incorporate that additional

21 information.

22 BY MR. DAVIS:

23 Q So it's too late at this point in this case

24 to achieve the results that you are purporting to

25 achieve, right?

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1 MR. COLLIER: Objection; form.

2 THE WITNESS: No. I don't understand that

3 statement.

4 BY MR. DAVIS:

5 Q This case was long since announced, wasn't

6 it?

7 A Yes.

8 Q And if the market relatively accurately

9 prices in the effect of an enforcement action that

10 actually occurs, then it's already been priced into

11 Google's stock; yes?

12 MR. COLLIER: Objection; form.

13 THE WITNESS: Now I think it's you who are

14 engaging in circular reasoning. That would imply

15 that you should never impose any fine on a

16 company, because the company has already been

17 punished because of the announcement of an

18 investigation or an action.

19 BY MR. DAVIS:

20 Q I think so, if you're going to calculate

21 fines based on stock price, yeah.

22 MR. COLLIER: Objection; form.

23 THE WITNESS: I guess you and I just have

24 different perspective on the use of event studies

25 and the ways in which an event study in this case

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1 can inform my opinion as an economist as to what

2 a minimum deterrent penalty would need to be in

3 order to cause a significant change in otherwise

4 highly profitable conduct for Google, or for

5 other similarly situated companies.

6 BY MR. DAVIS:

7 Q I think we're speaking the same language.

8 Your analysis would indicate that on the date that

9 this case was announced, on plus or minus a few days,

10 Google's stock price went down a lot, right?

11 A I'm sorry. In this analysis, I have --

12 there is an observation where Google's price did go

13 down as on a date where there was an investigation by

14 the EU -- so I'm sorry. I didn't, I mean I didn't

15 track the rest of your question.

16 Q I thought that you told me that you were

17 believing that it's reasonable to expect, based on

18 your analysis in section 7, that the market prices in

19 the ultimate outcome of an enforcement action in or

20 around the time that that action is announced.

21 Am I wrong?

22 A I said that it may. I'm trying to account

23 for the possibility that there's a big announcement of

24 a major investigation, and on that date, there's a big

25 change in the company's stock price, because investors

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1 are concerned about the impact of that event.  
2 And then I look, and if there are time  
3 periods where I can match up an announcement date and  
4 then an actual penalty amount, then I can observe,  
5 well, is there -- was there a corresponding -- was  
6 there a further stock price drop when the price was --  
7 when the fine was announced, in which case that would  
8 tend to indicate that the initial market reaction --  
9 Q Gotcha.  
10 A -- underestimated that particular amount.  
11 By the same token, if I observe a no stock  
12 price change on the date that the fine is announced,  
13 there still may have been an impact of that particular  
14 investigation; i.e., that amount of the fine may have  
15 been enough to cause investors to pay attention.  
16 How do I know? Let me look at these change  
17 in stock price on the date it was announced. That's  
18 why I look at both data points in my analysis.  
19 Q Except for any data points that don't hit  
20 the two-standard-deviation threshold, right?  
21 A Well, I look at --  
22 MR. COLLIER: Objection; form.  
23 THE WITNESS: I look at all of those, and  
24 the only question is: Are they sufficient when  
25 you combine them together? So when you combine

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1 them together, they are more likely to exceed  
2 that two-standard-deviation threshold.  
3 BY MR. DAVIS:  
4 Q When you picked two standard deviations as  
5 the threshold, you knew what the results of that  
6 analysis would be, right?  
7 A I did not, no.  
8 Q Had you known Google's market cap, would you  
9 have known what the results of the analysis would be?  
10 A No.  
11 Q If I define a sufficient fine as one that  
12 moves a stock price at least two standard deviations,  
13 and I know the market cap of the issuer, I know what  
14 fine I'm going to come up with, don't I?  
15 A No, you don't know the -- you have a good  
16 reason to expect it's going to be substantial if the  
17 company has significant volatility in its stock price  
18 in particular. So it's going to be some combination  
19 of the market capitalization of the company and the  
20 standard deviation the stock returns, which will  
21 differ on a company-by-company basis, and it will  
22 differ over time, and if you're at a good stopping  
23 point --  
24 Q I'm almost there.  
25 A Okay.

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1 Q When you calculate the relevant standard  
2 deviations, are you using all days or only days that  
3 you think of as a fine-related event?  
4 MR. COLLIER: Objection; form.  
5 THE WITNESS: I am using all days that are  
6 related to that particular conduct, so either the  
7 announcement or the fine. I guess that's -- if I  
8 understood your question correctly.  
9 BY MR. DAVIS:  
10 Q So, for instance, when you say that the  
11 standard deviation of Google's stock price in 2010 was  
12 three and a half percent, how do you calculate that  
13 number?  
14 A Well, it's the -- so there's two different  
15 standard -- well, there's a couple different standard  
16 deviations that I calculate. One is setting up kind  
17 of the big picture view of what's the standard  
18 deviation in the earlier time period and the later  
19 time period, and what is likely to be enough -- or  
20 what is going -- how big is one or two standard  
21 deviations in those different time periods.  
22 And then there's the event study itself, and  
23 there I describe the calculations of the standard  
24 deviations with regard to the days around the event  
25 date, so I look at the standard deviation plus or

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1 minus ten days, for example, in Figure 22, and that's  
2 why you see the little dotted lines that describe two  
3 standard deviations, one or two standard deviations  
4 over the stock returns over the course of that 20-day  
5 time period.  
6 Q The first standard deviation that you apply  
7 before the second one, that's calculated normally,  
8 right?  
9 A What do you mean "normally"? It's  
10 calculated over a broader time period, really trying  
11 to understand what is the market capitalization of the  
12 firm in these different time periods, what is the  
13 stock price, how is the stock price moving on a daily  
14 basis in these years, and now I would say that's the  
15 big picture view. I'm not using it to do a  
16 statistical test. It just gives me an order of  
17 magnitude sense of things.  
18 And then here, in the actual area where I'm  
19 calculating whether the event is within two standard  
20 deviations, I'm looking at the standard deviations  
21 within this narrower time period, because the standard  
22 deviation may change over time, and, in fact, does  
23 change. We see that in that earlier -- that first  
24 statement that you pointed me to. There's a different  
25 standard deviation in the earlier years as opposed to

<p style="text-align: right;">Page 290</p> <p>1 the later years.</p> <p>2 MR. DAVIS: Got it. This is now a good time</p> <p>3 for a break.</p> <p>4 THE VIDEOGRAPHER: The time is 5:30 p.m.</p> <p>5 This end unit 6. We're off the record.</p> <p>6 (Whereupon, a short recess was taken.)</p> <p>7 THE VIDEOGRAPHER: The time is 5:53 p.m.</p> <p>8 This begins unit number 7. We're on the record.</p> <p>9 BY MR. DAVIS:</p> <p>10 Q Dr. DeRamus, you ready to finish up here?</p> <p>11 A I am.</p> <p>12 Q Can you go to paragraph 33 of your report</p> <p>13 which starts on 18.</p> <p>14 A I'm there.</p> <p>15 Q Does paragraph 33 introduce Figure 1?</p> <p>16 A Yes, it does.</p> <p>17 Q If you look at paragraph 33 itself, in the</p> <p>18 fifth line, there's a sentence beginning with the word</p> <p>19 "because."</p> <p>20 Do you see that?</p> <p>21 A Yes.</p> <p>22 Q I'm going to read it just so we have it for</p> <p>23 the record.</p> <p>24 "Because both the harm and gain increase</p> <p>25 with the number of violations, so should the required</p>	<p style="text-align: right;">Page 292</p> <p>1 be reasonable to increase the size of the penalty as</p> <p>2 the number or the scope of the, the violations</p> <p>3 increases, but that at a certain point, one has</p> <p>4 reached the -- I refer to it as "optimal deterrent</p> <p>5 amount" here, again more in reference to the</p> <p>6 theoretical literature as opposed to what my specific</p> <p>7 task is here, which is to provide a range of deterrent</p> <p>8 penalties.</p> <p>9 Q Is overdeterrence only a concern at the</p> <p>10 maximal penalty level, or is it always a concern?</p> <p>11 MR. COLLIER: Objection; form.</p> <p>12 THE WITNESS: I would consider it always to</p> <p>13 be a concern.</p> <p>14 BY MR. DAVIS:</p> <p>15 Q Including like first penalty for the first</p> <p>16 violation; we don't want to overdeter with that</p> <p>17 penalty, right?</p> <p>18 A Potentially, yes.</p> <p>19 Q Am I understanding Figure 1 correctly to</p> <p>20 indicate that the line becomes flat when you reach the</p> <p>21 wrongdoer's total wealth?</p> <p>22 A No.</p> <p>23 Q I'm going to -- I think this will make</p> <p>24 everything easier -- mark as Exhibit 11 -- and I don't</p> <p>25 want you to think I'm doing any tricks. This is your</p>
<p style="text-align: right;">Page 291</p> <p>1 total penalty necessary for deterrence. However, at</p> <p>2 some point the level of the penalty is sufficiently</p> <p>3 high such that optimal deterrence has been achieved or</p> <p>4 the risk of overdeterrence exceeds the benefit of</p> <p>5 higher penalties. At that point, the total penalty</p> <p>6 amount no longer increases with the number of</p> <p>7 violations, and the curve flattens."</p> <p>8 Did I read that correctly?</p> <p>9 A You did.</p> <p>10 Q And you see you begin this paragraph 33, in</p> <p>11 the second sentence, with a reference to using</p> <p>12 Figure 1 to "summarize the implications of the</p> <p>13 economic literature reviewed above," right?</p> <p>14 A Correct. That's what I say.</p> <p>15 Q Can you tell me what economic literature</p> <p>16 supports the views expressed in your paragraph 33 and</p> <p>17 Figure 1?</p> <p>18 A Well, the first point is that at a certain</p> <p>19 point -- or I should say at a certain level of</p> <p>20 penalties, overdeterrence becomes a concern. That is</p> <p>21 a concern expressed in the literature, in the economic</p> <p>22 literature.</p> <p>23 The second is that, as a general concept,</p> <p>24 the -- one would expect harm and gain to increase with</p> <p>25 the number of violations. So in some region, it would</p>	<p style="text-align: right;">Page 293</p> <p>1 Figure 1. I have put the letters on it. Those are</p> <p>2 not your letters. I did that, because otherwise I</p> <p>3 don't know what to call them.</p> <p>4 If you've ever done cases with horizontal</p> <p>5 oil and gas wells, I could use like heel and toe, but</p> <p>6 it's inverted, so I can't.</p> <p>7 A Very good.</p> <p>8 (Exhibit 11 was marked for</p> <p>9 identification.)</p> <p>10 BY MR. DAVIS:</p> <p>11 Q I forget that you're -- yeah, okay. Just</p> <p>12 for the record, that is your Figure 1 with the</p> <p>13 exception of the A, B, C and D which I have inserted,</p> <p>14 right?</p> <p>15 A That's correct.</p> <p>16 Q At around Point A, it appears to me that the</p> <p>17 per penalty -- can I start that question over,</p> <p>18 Dr. DeRamus?</p> <p>19 A Yes.</p> <p>20 Q And at around Point A, it appears to me that</p> <p>21 per-violation penalty starts to increase; is that</p> <p>22 right?</p> <p>23 A Well, as I've drawn it here, yes, but I</p> <p>24 wouldn't impart any particular significance to that</p> <p>25 rate of increase.</p>

<p style="text-align: right;">Page 294</p> <p>1 Q Is there any significance to the change in 2 slope at A, B or C? 3 A No. It's just how I drew, it's just how I 4 drew the graph. You can think of it actually as a 5 linear relationship is probably the better way to 6 think about it, based on if there is a per-violation 7 approach. This is just a compressed graph for the 8 scale. 9 Q So am I understanding correctly that if we 10 were not constrained by scale, there would be a 11 straight line from the origin -- 12 A Yes. 13 Q -- to Point D? 14 A There would be if you were doing that based 15 on a maximal penalty amount where the deterrent 16 penalty was determined -- the appropriate amount was 17 determined to be based on that per-violation statutory 18 maximum. 19 So if you were to apply a different 20 framework, somebody may decide that a lesser amount at 21 some point were to apply, but at certain point, at a 22 certain point, the appropriate amount should increase, 23 so my primary focus is on the region from D forward, 24 and particularly what that implies in terms of the 25 order of operations from an economic perspective that</p>	<p style="text-align: right;">Page 296</p> <p>1 amount or a certain extensiveness of conduct, that it 2 might be appropriate to apply that maximal amount. 3 Q And before I get to Point D, so when my 4 penalty is still increasing with the number of 5 violations, that achieves marginal deterrence, because 6 the penalty goes up each time I do another violation, 7 right? 8 A I guess I was offering this up as an 9 illustration of a different point rather than marginal 10 deterrence. I was really offering it up as an 11 explanation for how to determine an appropriate 12 penalty amount based on economic principles in this 13 matter, when you have a statutory provision that calls 14 for an up-to amount; i.e., a cap on the maximum. 15 So that just -- it's just the interplay 16 between the, the way in which one needs to, from an 17 economic perspective, one needs to assess first the 18 deterrent penalty amount and then assess whether there 19 are constraints on the imposition of that deterrent 20 penalty amount based on the statutory penalties. 21 Q Do your section 6 or section 7 account for 22 the principle of marginal deterrence? 23 MR. COLLIER: Objection; form. 24 THE WITNESS: I would need to think further 25 about that question marginal deterrence in terms</p>
<p style="text-align: right;">Page 295</p> <p>1 one should follow in determining an appropriate 2 per-violation penalty amount in this case. 3 (Exhibit 12 was marked for 4 identification.) 5 BY MR. DAVIS: 6 Q Understood. 7 I've now marked as Exhibit 12, the same 8 exhibit as 11, but with a line on it. I apologize. I 9 only have the one copy. 10 With the exception of the fact that I 11 struggled to draw a straight line rather than a wavy 12 line, if we weren't constrained by scale, is that how 13 you view the growth and eventual ceasing end growth of 14 per-violation penalties? 15 A Correct in terms of -- maybe that actually 16 is a good representation, having both those lines on 17 there as the difference between what someone might 18 award for a lesser amount versus the statutory maximum 19 amount. 20 So that particular figure, the straight line 21 assumes that every violation should -- there should be 22 the maximum applied to every violation from the get-go 23 as opposed to an alternative way in which a jury might 24 consider less than, but at a certain point, a less 25 than maximal penalty per violation, but at a certain</p>	<p style="text-align: right;">Page 297</p> <p>1 of the approach -- the approach I have taken here 2 is to step back, consider the conduct in its 3 totality, and assess what appropriate deterrent 4 amounts are, and to estimate those based on what 5 I consider to be reasonable economic methods, and 6 then back into a per-violation amount. 7 And for all intents and purposes, as I 8 describe in my report, whether the number of 9 violations that the jury ultimately determines is 10 \$579 billion or whatever the number was that 11 Dr. Wiggins provided, or many trillions of 12 violations, I don't see that there is a 13 substantive change in the appropriate amount of a 14 deterrent penalty. 15 BY MR. DAVIS: 16 Q So as applied to this case, given the way 17 that Mr. Andrien counts violations as per auction, is 18 Point D on the x-axis somewhere above \$500 billion? 19 MR. COLLIER: Objection; form. 20 THE WITNESS: I'm sorry. Say that one more 21 time. Somewhere above \$500 billion? 22 BY MR. DAVIS: 23 Q On the x-axis. 24 A Oh, yes. I'm sorry. I consider the Point D 25 to be well less than \$500 billion.</p>

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1 Q So on the x-axis, Point D is closer to  
2 \$1 billion than \$500 billion?  
3 MR. COLLIER: Objection; form.  
4 THE WITNESS: I don't have an exact number.  
5 I'm using this for illustrative purposes of a  
6 method and particularly going from statutory  
7 penalties that are calculated on a per-violation  
8 amount or rather that are subject to a cap, and  
9 the economic concepts of deriving an appropriate  
10 deterrent penalty amount. I just -- and I  
11 consider that the -- based on the differing  
12 numbers that Dr. Wiggins and Jeffrey Andrien have  
13 offered in this matter, that my opinions still  
14 wouldn't change, even though I disagree with  
15 certain of Dr. Wiggins' asserted corrections to  
16 the Andrien numbers, for example.  
17 BY MR. DAVIS:  
18 Q So I certainly don't want to hold you to an  
19 exact number, but can you tell me whether, given your  
20 theory, Point D on the x-axis is closer to zero or  
21 \$100 billion?  
22 A Again, you're -- I think you're trying to  
23 impart a greater numerical precision to that  
24 illustrative graph, which is -- it's more intended to  
25 or is only intended to derive the -- or to provide

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1 that conceptual framework.  
2 And it's the continuation of what I also  
3 talk about in my executive summary, in particular, a  
4 paragraph where I describe a particular formula,  
5 basically a constraint on the number of -- on the  
6 per-penalty violation amount, and there's an order of  
7 operations I describe in -- I believe it's paragraph  
8 12. It's a high-level conceptual graph of a  
9 methodological approach as opposed to a representation  
10 of how different numbers should be plotted on, on a  
11 particular graph.  
12 Q I get it. It's depicting your opinion that  
13 at a certain number of violations, the per-violation  
14 penalty no longer increases, because you've reached  
15 the point where an additional dollar will result in  
16 overdeterrence, right?  
17 A Effectively, yes.  
18 Q And how --  
19 A Or there's a different way to describe it  
20 would be there is an optimal -- if you consider the  
21 conduct and you consider, for example, the expected  
22 benefits of the conduct or the amount of the signal  
23 that needs to be established for shareholders to react  
24 to that particular conduct, once you've established  
25 that, is there a point at which you might need to

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1 reduce that penalty because of constraints -- because  
2 you're constrained by the statutory provisions.  
3 So, for example, if I were to determine that  
4 there were \$200 billion of net present, net present  
5 value benefits once you factored into the -- factored  
6 the probability of detection and enforcement and  
7 collection, but the only statute that the plaintiffs  
8 could recover under was the Utah statute, and there  
9 were only 5,000 violations, statutory violations that  
10 the jury found in that state, then you would be  
11 somewhere much lower down on that -- on the earlier  
12 part of that figure relative to the other -- to the  
13 flat portion that I determined initially. It's a  
14 constrained optimization function.  
15 Q And when you do calculate a per-violation  
16 penalty in your report, you do it by dividing what you  
17 believe to be the optimal deterrent aggregate penalty  
18 by the number of violations; fair?  
19 A It's what I -- again, maybe it's the word  
20 "optimal." Again, I'm providing a range of, 6 penalty  
21 amounts for the jury to consider and I think the  
22 appropriate way to turn that into a per-violation  
23 amount is to then divide that by the amount of  
24 violations that the jury determines, and if for some  
25 reason that the jury considers the number of

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1 violations to be very, very low, then that might  
2 constrain the per-violation amount, so that might  
3 constrain the total violation amount based on the  
4 concepts provided here in this graph.  
5 Q And it also means that if the jury  
6 determines that only ten percent of the violations  
7 that plaintiffs claim to be violations were, in fact,  
8 violations, the aggregate penalty remains the same, in  
9 your view?  
10 MR. COLLIER: Objection; form.  
11 THE WITNESS: Well, there are a couple --  
12 this is a two-dimensional -- this figure right  
13 here is a two-dimensional representation of what  
14 is probably a more complex multidimensional  
15 problem for the jury to figure out, and it's one  
16 of the reasons why I provided alternative ways of  
17 deriving penalty amounts.  
18 So the jury, for example, could decide that  
19 the -- if the jury -- if the conduct were  
20 constrained -- were defined for a shorter time  
21 period or were limited to Bernanke only, for  
22 example, I have some numbers for a penalty range  
23 for Bernanke, in which case they would then take  
24 that line and then figure out the number of, of  
25 statutory violations, and then divide that



<p style="text-align: right;">Page 302</p> <p>1 number, and then make sure that that number is</p> <p>2 less than the relevant statutory maximum in each</p> <p>3 of the relevant states.</p> <p>4 So that, that line across the stop, the</p> <p>5 horizontal line is not necessarily a fixed line.</p> <p>6 It can shift, depending on the, the way the</p> <p>7 ultimate finder of fact concludes is the exact</p> <p>8 scope of the actionable conduct.</p> <p>9 BY MR. DAVIS:</p> <p>10 Q New topic. Is there any area in which you</p> <p>11 disagree with Mr. Andrien's opening report in this</p> <p>12 case?</p> <p>13 A As I sit here today, not that I can think</p> <p>14 of. He has different calculations than I do. I</p> <p>15 approach it through my own lens and my own approach,</p> <p>16 but I don't -- the scope of my charge was to respond</p> <p>17 to Dr. Wiggins and Dr. Skinner, and I think I'm pretty</p> <p>18 clear in my report where I take issue with Dr. Skinner</p> <p>19 and Dr. Wiggins, and in some of those cases, there's</p> <p>20 probably overlap in -- where I consider certain things</p> <p>21 that Doctor -- that Jeffrey Andrien did in the Andrien</p> <p>22 report to be reasonable.</p> <p>23 Q Sitting here right now, there's nothing in</p> <p>24 Mr. Andrien's reports that you think is unreasonable,</p> <p>25 is there?</p>	<p style="text-align: right;">Page 304</p> <p>1 efficiency; i.e., would one expect investors</p> <p>2 collectively to reasonably predict and accurately</p> <p>3 predict the outcome of a very uncertain process.</p> <p>4 So that's why I think both those dates are</p> <p>5 ultimately relevant and why it's important to</p> <p>6 take into consideration both the announcement</p> <p>7 date and the actual penalty date. There are</p> <p>8 other kinds of event studies where the event is</p> <p>9 single, a single event that doesn't require this</p> <p>10 matching up with an announcement date, for</p> <p>11 example.</p> <p>12 BY MR. DAVIS:</p> <p>13 Q Gotcha. I think I can do it simpler.</p> <p>14 If, on a Tuesday, a fine is imposed, and the</p> <p>15 issuer's stock price doesn't move, that is consistent</p> <p>16 both with the fine having no impact on investors and</p> <p>17 also with the possibility that the investors had</p> <p>18 already priced in the imposition of that fine, right?</p> <p>19 A It could be either way, yes.</p> <p>20 Q Have you, in your work in this case,</p> <p>21 investigated how Google compensates its executives and</p> <p>22 managers?</p> <p>23 A Not in great detail. I do -- I've observed</p> <p>24 what Google says in its 10-Ks. I understand that it</p> <p>25 provides certain stock compensation and options that</p>
<p style="text-align: right;">Page 303</p> <p>1 A As I sit here today, no.</p> <p>2 Q Apologies for returning to the topic of</p> <p>3 event studies briefly.</p> <p>4 On the date that a fine is imposed, the</p> <p>5 stock price won't move if the market has accurately</p> <p>6 predicted the imposition and amount of the fine</p> <p>7 already; true?</p> <p>8 A I think so, but read that back slowly one</p> <p>9 more time.</p> <p>10 Q Yeah, I don't know if I did it unnecessarily</p> <p>11 confusingly. That's what I get for writing questions</p> <p>12 out.</p> <p>13 On the date that a fine gets imposed, if the</p> <p>14 market has accurately foreseen the imposition and</p> <p>15 amount of that fine already, the stock price won't</p> <p>16 move on the date that the fine is imposed, holding</p> <p>17 everything else equal; true?</p> <p>18 A That would be my expectation, yes.</p> <p>19 Q And so if the market is relatively</p> <p>20 efficient, it's no surprise that you don't see a</p> <p>21 significant stock drop on the days fines are imposed,</p> <p>22 is it?</p> <p>23 MR. COLLIER: Objection; form.</p> <p>24 THE WITNESS: Well, I think that calls for</p> <p>25 maybe a deeper conversation about stock market</p>	<p style="text-align: right;">Page 305</p> <p>1 are disclosed, so that's -- my expectation is that</p> <p>2 there's some combination of cash and stock.</p> <p>3 Q Are you actually offering the opinion in</p> <p>4 this case that Google does not align its managers'</p> <p>5 incentives with those of its shareholders?</p> <p>6 MR. COLLIER: Objection; form.</p> <p>7 THE WITNESS: I think I describe this issue</p> <p>8 in a paragraph in my report if I would turn to</p> <p>9 that section where I discuss the principal-agent</p> <p>10 problem, and give me one quick minute. I think I</p> <p>11 can find it for you really quickly.</p> <p>12 So this is all in -- maybe I'll just start</p> <p>13 your reference to paragraph 38 and forward, but I</p> <p>14 give you an example in 39 that goes through that</p> <p>15 in some detail, with an example, to say that</p> <p>16 effectively there are attempts to align, to some</p> <p>17 extent, the incentives of management and</p> <p>18 shareholders with stock-based compensation, but</p> <p>19 it is not sufficient to remove the incentive for</p> <p>20 a manager in this case to engage in conduct that</p> <p>21 might profit them as a result of that</p> <p>22 short-term -- the bonus that they receive,</p> <p>23 whether it's cash or stock.</p> <p>24 Regardless of the form of compensation,</p> <p>25 they're still net/net ahead by engaging in</p>



<p style="text-align: right;">Page 306</p> <p>1 conduct that provides them a short-term benefit,  2 even if long-term detriment of shareholders.  3 BY MR. DAVIS:  4 Q Are you offering the opinion on a  5 comparative basis that Google does a better or worse  6 job than the average corporation in attempting to  7 align its managers' incentives with those of its  8 shareholders?  9 A I'm not offering any opinion about the  10 comparative effects of that for Google versus anybody  11 else.  12 Q New topic. Are you aware of any evidence  13 that any participants in the AdX auction would not  14 have participated had they been aware of the details  15 of RPO, DRS or Bernanke?  16 MR. COLLIER: Objection; form.  17 THE WITNESS: If you're asking if I've seen  18 a document from a participant that said we would  19 not participate, I have not seen such a document;  20 i.e. -- yeah, I guess I'm trying to figure out  21 the thrust of your argument. I haven't seen a  22 specific document saying we would not  23 participate.  24 As an economist, however, I would expect  25 that had this information been fully disclosed,</p>	<p style="text-align: right;">Page 308</p> <p>1 THE WITNESS: I would say maybe more  2 generally that had the information been fully  3 disclosed, there may have been -- or I would  4 expect, given the, the magnitude of the conduct,  5 I would expect that everybody knew perfectly and  6 was able to optimize those -- their bids to  7 account for that full and complete information,  8 and even there it's really hard to assess how  9 that would happen, because it's so -- a number of  10 very complicated algorithms, but I can see a  11 world in which there would have been users of  12 non-Google ad tech products that would have  13 continued to use those non-ad tech -- those  14 non-Google products in the -- and not  15 participated in, and not migrated to the use of  16 Google's ad-buying tools, for example.  17 I believe there were instances in which  18 there were direct deals that were affected by the  19 conduct, but again I'm -- there's a broad range  20 of behaviors that really Dr. Weinberg in  21 particular went through with each of the  22 conducts, and that informed my opinion that the  23 impact would likely be substantial, but then --  24 so there are others who have done a fairly  25 detailed analysis, and I would point you to</p>
<p style="text-align: right;">Page 307</p> <p>1 particularly at the inception, that that would  2 have changed significantly the incentives of, of  3 market participants whether to participate in the  4 auction and, if they were to participate in the  5 auction, what bids to submit.  6 BY MR. DAVIS:  7 Q Have you done any analysis indicating to you  8 that one or more participants in the AdX auction, from  9 your perspective as an economist, would have had their  10 incentives change to such an extent that they would no  11 longer have participated in that auction going forward  12 if Bernanke, RPO and DRS were disclosed?  13 A I'm sorry. I'm trying to figure out whether  14 you're asking me an issue of fact; i.e., whether  15 there's a document that I've seen versus a matter of  16 my expectation as an economist.  17 Q So you said as an economist you would expect  18 that if the information were disclosed, participants'  19 incentives would have changed, and I'm wondering if,  20 as an economist, you have done an analysis indicating  21 that anyone's incentives would have changed so much  22 that they would have stopped participating in the AdX  23 auction, like as opposed to changing their strategies  24 within the AdX auction.  25 MR. COLLIER: Objection; form.</p>	<p style="text-align: right;">Page 309</p> <p>1 Dr. Weinberg, but I have not reviewed a specific  2 document from a customer that said, for example,  3 hey, if we had known, we would not have done it,  4 but I have not -- that was not my charge.  5 BY MR. DAVIS:  6 Q I think I can shortcut it. Let me try this.  7 Is there an analysis disclosed in your  8 expert report indicating one way or the other whether  9 one or more participants in the AdX auction would have  10 stopped participating in that auction if any of DRS,  11 RPO or Bernanke had been disclosed to them?  12 A Well, if by "analysis" you mean have I  13 quantified that, I have not quantified that. I have  14 not estimated a -- well, hang on. Let me think for a  15 minute.  16 Maybe I'll just say it that way. The -- I  17 don't think -- I have not specifically quantified that  18 particular factor. I have taken it into consideration  19 in a general way in considering the likely scope of  20 the impact, and particularly the fact that the conduct  21 increased the amount of, of auctions won by users of  22 Google's products.  23 So we talked about that earlier in -- and  24 there's empirical evidence in that regard, to that  25 regard, and I would expect that to result in a greater</p>

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1 migration of competitor -- of people using  
2 competitors' products, I would expect them to then  
3 migrate to using Google's products.  
4 But other than my references to  
5 Dr. Weinberg, my general discussion, and then the  
6 documents responsible upon which I rely in doing my  
7 calculations that are disclosed in my report, I have  
8 not done any other independent analysis of that.  
9 MR. DAVIS: I will pass the witness.  
10 MR. COLLIER: Okay. Let me take a break,  
11 see if I've got anything. If I do, it won't be  
12 too terribly long.  
13 THE VIDEOGRAPHER: The time is 6:23 p.m.  
14 We're off the record.  
15 (Whereupon, a short recess was taken.)  
16 THE VIDEOGRAPHER: The time is 6:48 p.m.  
17 We're on the record.  
18 \* \* \* \* \*  
19 EXAMINATION BY COUNSEL FOR PLAINTIFFS  
20 BY MR. COLLIER:  
21 Q Good evening, Dr. DeRamus.  
22 A Good evening.  
23 Q Dr. DeRamus, can you recall the questions  
24 Google's counsel asked you today have been about your  
25 opinions in your corrected rebuttal report?

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1 A Yes.  
2 Q Have -- is any of your testimony today  
3 intended to change any of the opinions you expressed  
4 in your rebuttal report?  
5 A No.  
6 Q Was any of your testimony today intended to  
7 limit the opinions you've expressed in your rebuttal  
8 report?  
9 A No.  
10 Q Do you believe you had sufficient facts and  
11 data to reach the conclusions you reached in your  
12 rebuttal report?  
13 A Yes, I do.  
14 Q Did anything about the questioning or the  
15 exhibits put before you today cause you to change any  
16 of the opinions that you've put in your rebuttal  
17 report?  
18 A No.  
19 Q And you've discussed with Google's counsel  
20 today various methodologies that you have in your  
21 report, right?  
22 A That's right.  
23 Q Were the methodologies you used in your  
24 expert report based on reliable and generally accepted  
25 deterrence principles?

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1 A Yes, they were.  
2 Q Were the methodologies that you used in your  
3 rebuttal report based on reliable and generally  
4 accepted economic principles?  
5 A Yes, very much so.  
6 Q Can the methodologies in your report and  
7 that you discussed today in your deposition be tested?  
8 A Yes, they can.  
9 Q Have the methodologies in your report been  
10 the subject of peer review and publication?  
11 A Yes.  
12 Q Is deterrence a well-established subject in  
13 the field of economics, or is it not part of that  
14 field?  
15 A Yes, it is.  
16 Q I asked you an "either."  
17 A Oh, I'm sorry. So yes, it is a  
18 well-established field in economics or it's a  
19 well-established topic of study in the field of  
20 economics. It's part of the broader discussion of  
21 incentives. It's more about negative incentives  
22 instead of positive incentives, which is the subject  
23 of most economic research.  
24 Q That's the carrot versus the stick, right?  
25 A Yes.

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1 Q Both the carrot and the stick can be used to  
2 motivate employees or entities, right?  
3 A Correct, and to, to provide a -- to motivate  
4 a change in the course of conduct of an employee or a  
5 company generally.  
6 Q Did you reliably apply the methodologies you  
7 discussed with Google's counsel today to form your  
8 opinions in this case?  
9 A I'm sorry. Could you repeat the question.  
10 Q Did you reliably apply the methodologies  
11 you've discussed in your rebuttal report and with  
12 Google's counsel today to form your opinions in this  
13 case?  
14 A Yes, I did.  
15 Q Did you have sufficient facts and data to  
16 reach the opinions that you've reached in this case  
17 about the penalty ranges that could be necessary to  
18 deter Google's conduct?  
19 A Yes.  
20 Q Dr. DeRamus, do you recall -- and it was  
21 early in the day. You were asked a number of  
22 questions about a hypothetical apple cart with bruised  
23 apples.  
24 A I do recall those questions.  
25 Q Is the hypothetical apple cart analogous to

<p style="text-align: right;">Page 314</p> <p>1 the ad tech market and the conduct that you've</p> <p>2 analyzed in this case?</p> <p>3 A Not by any stretch of the imagination, no.</p> <p>4 Q Is selling apples the same as ad auctions?</p> <p>5 A No, it's not. There are substantive --</p> <p>6 well, the differences are just -- I could go on and</p> <p>7 on, but there's so many differences associated with</p> <p>8 the technology, the interrelationship between the</p> <p>9 markets, the snowball effect, the detectability of the</p> <p>10 conduct. It's a fairly long list.</p> <p>11 Q Have you ever bought apples?</p> <p>12 A I have.</p> <p>13 Q Do you feel like you're generally able to</p> <p>14 detect a bruised apple?</p> <p>15 A I am indeed.</p> <p>16 Q How long does it take to you detect a</p> <p>17 bruised apple?</p> <p>18 A I can usually -- if it's pointed the right</p> <p>19 way, I can tell by looking at it.</p> <p>20 Q Is that your understanding of how hard it is</p> <p>21 to detect Google's course of conduct or misconduct in</p> <p>22 the auction space?</p> <p>23 A No. The ability to detect that course of</p> <p>24 conduct would have been exceptionally difficult.</p> <p>25 Q Dr. DeRamus, do you recall a large series of</p>	<p style="text-align: right;">Page 316</p> <p>1 A No. I think disclosure does require a</p> <p>2 complete and transparent disclosure of the rules of</p> <p>3 the game, as it were, as applied in this case.</p> <p>4 Q Does disclosure, as you would use that term,</p> <p>5 require allowing the participants to understand the</p> <p>6 impact of the conduct?</p> <p>7 A Yes, it would.</p> <p>8 Q You spoke for a long time today about the</p> <p>9 probability of detection.</p> <p>10 Do you recall that?</p> <p>11 A I do.</p> <p>12 Q Do you provide the jury with sufficient</p> <p>13 information and guidance on how to adjust or determine</p> <p>14 the probability of detection in this case?</p> <p>15 A Yes.</p> <p>16 Q Can the jury actually determine, as a</p> <p>17 factual matter, the probability of detection -- I'll</p> <p>18 scratch that.</p> <p>19 Does -- I'd ask you to look at paragraph 12</p> <p>20 of your report.</p> <p>21 A Okay.</p> <p>22 Q Does paragraph 12 provide the jury with a</p> <p>23 formula to determine the appropriate maximal -- the</p> <p>24 appropriate -- sorry -- deterrence penalty in this</p> <p>25 case?</p>
<p style="text-align: right;">Page 315</p> <p>1 questions where Google's counsel asked you to compare</p> <p>2 a world where Google's Bernanke, DRS and RPO conduct</p> <p>3 was disclosed versus undisclosed, basically?</p> <p>4 A I do recall those questions.</p> <p>5 Q And I recall you giving an answer that said</p> <p>6 something about needing to further discuss disclosures</p> <p>7 and the meaning of the word disclosures.</p> <p>8 Well, let me just ask it this way: Would</p> <p>9 you agree with me that for a disclosure to be</p> <p>10 effective, it would need to be disclosed in advance of</p> <p>11 the participant's conduct?</p> <p>12 A I agree with that statement, yes.</p> <p>13 Q A disclosure after the fact can't remedy</p> <p>14 the, the conduct or the harm, can it?</p> <p>15 MR. DAVIS: Objection; leading.</p> <p>16 BY MR. COLLIER:</p> <p>17 Q Well, can it?</p> <p>18 A I don't believe so. The whole point of</p> <p>19 disclosure is providing information to a market</p> <p>20 participant before they choose to engage in that</p> <p>21 particular course of conduct, and I would say</p> <p>22 particularly here when it involves auctions, I would</p> <p>23 say that disclosure in advance is particularly</p> <p>24 important.</p> <p>25 Q And can just any disclosure do?</p>	<p style="text-align: right;">Page 317</p> <p>1 A Yes. It provides them with a formula to</p> <p>2 convert a deterrent penalty into an appropriate</p> <p>3 per-violation penalty amount.</p> <p>4 Q And like all formulas, does that have</p> <p>5 inputs, factual inputs?</p> <p>6 A Yes, it does.</p> <p>7 Q Is your formula sufficient for the jury to</p> <p>8 determine the appropriate per-violation amount or</p> <p>9 total deterrence amount, even if the input factors</p> <p>10 differ from any of your assumptions in your report?</p> <p>11 A Yes. In combination with the other</p> <p>12 information that I provide in my report, yes, it</p> <p>13 provides -- that totality of information provides the</p> <p>14 jury with sufficient ways to change the inputs into</p> <p>15 those calculations to derive an alternative penalty</p> <p>16 amount on a per-violation basis, or on an aggregate</p> <p>17 basis as well.</p> <p>18 Q And I'd ask you to look at Exhibit 5. For</p> <p>19 clarity, it looks like this.</p> <p>20 A Mr. Bernanke. Yes. All Mr. Bernanke.</p> <p>21 Q Exhibit 5, for the record, is</p> <p>22 GOOG-DOJ-28385887, and I'm going to turn you to the</p> <p>23 page counsel asked about, which ends in 895.</p> <p>24 A Yes.</p> <p>25 Q Do you recall a lot of discussion with</p>

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1 Google's counsel about the sentence "[REDACTED]  
2 [REDACTED]," parens -- and that sign there; does that  
3 mean "approximately"?  
4 A Yes, it does.  
5 Q "[REDACTED] [REDACTED] close  
6 parens, "revenue for GDN."  
7 A Yes, I recall those questions.  
8 Q So for purposes of your calculations and  
9 your formula, did you use Google's estimate of  
10 [REDACTED], or did you use their estimate of  
11 [REDACTED] a year out of this line?  
12 A I used [REDACTED] a year for the revenue  
13 line, and I think I described how I have different  
14 sensitivities of that calculation or of those  
15 calculations that use different profit margins.  
16 Q Do you recall today Google's counsel  
17 representing to you that individuals named Brin and  
18 Page own approximately 51 percent of the voting  
19 control of Google?  
20 A Yes.  
21 Q From an economic perspective, does that make  
22 it reasonable to assess what the 51 percent  
23 shareholders would need to take some action?  
24 A I'm sorry. I don't quite understand the  
25 question.

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1 Q Let me ask it this way: Did you read  
2 Mr. Brin's deposition?  
3 A Yes, I did.  
4 Q Do you recall what Mr. Brin knew about AdX?  
5 A I recall he professed to know very little  
6 about AdX. He may even have not been sure what AdX  
7 was.  
8 Q Did that surprise you?  
9 A It did surprise me.  
10 Q What does that tell you about the need for  
11 deterrence in this case?  
12 A Well, it would tell me that the need -- that  
13 there would be a need for a substantial penalty amount  
14 to get Mr. Brin's attention, if, in fact, his  
15 determination of a penalty was -- whether it met a  
16 certain threshold level were enough for him to be  
17 actually involved in the management of the business.  
18 It certainly indicates to me that he was not  
19 involved at all in the ad tech business, or at least  
20 that's what I took from his deposition, and therefore,  
21 a higher penalty amount would need to be applied, all  
22 else equal.  
23 Q Now, with that said, did you increase your  
24 deterrence penalty amounts in any way or in some way  
25 based on Mr. Brin's not knowing what AdX is or the

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1 details of AdX?  
2 A No. It did inform my opinion that  
3 notwithstanding the unique ownership structure or  
4 shareholding structure of the company, that did not  
5 change my conclusion that the principal-agent  
6 framework was the appropriate framework to apply, and  
7 it further informed my opinion that the amounts of  
8 deterrent penalties that I calculated were reasonable  
9 and, in fact, likely necessary in order to deter such  
10 conduct in the future.  
11 Q Okay. Do you have an understanding as to  
12 whether AdX is a part of the current Department of  
13 Justice versus Google suit? I believe counsel called  
14 it the Virginia suit.  
15 A It is my understanding that it is a part of  
16 that suit, yes, very much of a focus.  
17 Q Do you recall a lot of discussion with  
18 Google's counsel about two standard deviations?  
19 A Yes.  
20 Q I'm asking to ask you just a few follow-ups  
21 on that.  
22 Am I -- does two standard deviations from  
23 the mean correspond to a 95 percent confidence  
24 interval?  
25 A Yes, it does.

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1 Q Does two standard deviations from the mean  
2 correspond to a five percent significance level?  
3 A Yes.  
4 Q Is it common for economists such as yourself  
5 to use a 95 percent confidence interval?  
6 A Yes, it is.  
7 Q Is it common for economists such as yourself  
8 to use a five percent significance level?  
9 A Yes, it is.  
10 Q Do you have an opinion on whether or not the  
11 use of a 95 percent confidence interval or a five  
12 percent significance level is common or uncommon in  
13 economics literature?  
14 A I would say not only is it common, it's  
15 standard practice. It is what I expect to observe in  
16 the vast majority of literature, of the, of the  
17 economic literature.  
18 Q And last couple of questions.  
19 At the very end of the day, you discussed  
20 with Google's counsel the concept of overdeterrence,  
21 right?  
22 A Yes.  
23 Q Is, is there a concept of underdeterrence?  
24 A Absolutely. That's a big part of the entire  
25 motivation for the need to divide the expected gains

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1 or the expected societal harm by the probability of  
2 detection, because if you don't do that, then it will  
3 also mean you will be in this underdeterrence world.  
4 Q Is underdeterrence only a concern at the  
5 minimal penalty levels or in all penalty levels in  
6 your range?  
7 A I can say that underdeterrence is just a  
8 general concern that could apply across the board, so  
9 regardless of where in the range one is, that one can  
10 be concerned about the fact that the deterrent level  
11 was not set sufficiently high, and so there still  
12 might be -- if one has underestimated the amount of  
13 benefits to Google and applied even a probability  
14 multiplier to that underestimate, it still may result  
15 in an underdeterrent amount.  
16 Q And for your expert report and the testimony  
17 you're going to present to the jury, did you take into  
18 account making sure that the proposed penalty ranges  
19 you provided neither underdeterred nor overdeterred  
20 Google or the wrongdoer?  
21 A Yes, I did take that into consideration.  
22 MR. COLLIER: Pass the witness.  
23  
24  
25 //

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1 \* \* \* \* \*  
2 FURTHER EXAMINATION BY COUNSEL FOR GOOGLE  
3 BY MR. DAVIS:  
4 Q Just a couple of quick ones.  
5 You mentioned that your methodologies are  
6 peer-reviewed. Can you give me the best one or two  
7 peer-reviewed citations for the methodology in section  
8 7 of your report?  
9 A That is the use of an event study analysis.  
10 An event study analysis has been peer-reviewed, has  
11 been -- it is regularly used in the economic  
12 literature and in the finance literature, and I  
13 believe you even described -- you even referenced one  
14 such study of that, of that methodology.  
15 Q I should have asked a better question. Is  
16 there a peer-reviewed study or paper using an event  
17 study to calculate a deterrent penalty or a fine, to  
18 your knowledge?  
19 A Not to determine a deterrent penalty or  
20 fine. The question is one of methodology. The  
21 methodology that I use in that section is  
22 peer-reviewed and, and regularly used in a very broad  
23 range of contexts, including the way -- or I would say  
24 including in contexts that are analogous to what I've  
25 done here.

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1 Q Where in your report have you disclosed the  
2 opinion that it would have been exceptionally  
3 difficult for advertisers or publishers to detect one  
4 or more of Bernanke, DRS or RPO?  
5 MR. COLLIER: Objection; form.  
6 THE WITNESS: I believe you and I discussed  
7 that earlier on. You were asking me about the  
8 detection issue, and I believe that came up in a  
9 prior discussion or a prior question that you  
10 raised with me.  
11 BY MR. DAVIS:  
12 Q So your attorney -- I should say the  
13 plaintiffs' attorney -- was asking you whether it  
14 would be similarly easy to detect Bernanke, DRS or RPO  
15 as compared to a bruise on an apple, right?  
16 A Yes, on that one.  
17 Q You said it would be exceptionally difficult  
18 for advertisers or publishers to detect RPO, DRS or  
19 Bernanke, didn't you?  
20 A Yes, I did say that.  
21 Q That's not something that you have expertise  
22 in, is it?  
23 MR. COLLIER: Objection; form.  
24 THE WITNESS: Well, it is in the sense that  
25 I've reviewed -- I'm an economist by training. I


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1 understand the way in which machine-learning  
2 models work. I understand enough of the specific  
3 algorithms that were used and the specific  
4 bidding strategies and the deviations of those  
5 bidding -- of those bidding programs from the --  
6 from a standard second price auction, for  
7 example.  
8 So I understand those, and I've worked on  
9 those issues in other contexts, and that tells me  
10 something about the exceptionally -- how  
11 difficult it would be for a party to really  
12 understand and to measure exactly the formula  
13 that Google was applying, even to the effect of  
14 the throttling that Google was doing to attempt  
15 to hide some of the different strategies.  
16 There's lots of different ways that, in terms of  
17 how I implemented those strategies, that would  
18 have made it exceptionally difficult.  
19 BY MR. DAVIS:  
20 Q And whether with respect to machine-learning  
21 algorithms or otherwise, again where in your report is  
22 any discussion of the technological difficulty or lack  
23 thereof of detecting the allegedly deceptive conduct  
24 at issue?  
25 Go ahead and look if you need to. I don't



<p style="text-align: right;">Page 326</p> <p>1 mean to preclude that.</p> <p>2 MR. COLLIER: Objection; form.</p> <p>3 (Witness peruses document.)</p> <p>4 THE WITNESS: It's easier if I do this on a</p> <p>5 running basis to show generally where I'm</p> <p>6 describing the complex interdependencies within</p> <p>7 the ad tech industry and among the various DVAA</p> <p>8 products. I talk about that in 55 and 56.</p> <p>9 BY MR. DAVIS:</p> <p>10 Q Those are paragraphs? I'm sorry.</p> <p>11 A I'm sorry. Yes, in paragraphs 55 and 56, I</p> <p>12 reference Dr. Weinberg's opening report about how the</p> <p>13 conduct changed the auction procedures. I -- and how</p> <p>14 this affected -- would span many years, multiple years</p> <p>15 in many different instances of deceptive conduct.</p> <p>16 Give me a moment.</p> <p>17 (Witness peruses document.)</p> <p>18 THE WITNESS: So I'd start on paragraph 97.</p> <p>19 That's probably a little bit more detailed</p> <p>20 discussion here. This is rebutting Dr. Wiggins'</p> <p>21 claim that he Google made no incremental profits</p> <p>22 from the alleged deception.</p> <p>23 His theory is effectively that everybody</p> <p>24 learns instantaneously from the market and can</p> <p>25 instantaneously adapt their conduct. Therefore,</p>	<p style="text-align: right;">Page 328</p> <p>1 BY MR. DAVIS:</p> <p>2 Q Are you finished with your answer?</p> <p>3 A Yes. Oh, I'm sorry. I should add: But it</p> <p>4 was also within the context of your hypothetical of an</p> <p>5 apple cart; that is to say it was part of the reason</p> <p>6 why I think the apple cart analogy is simply</p> <p>7 inapposite to this particular case.</p> <p>8 Q You're not offering any opinions on the</p> <p>9 adequacy of Google's disclosures, if any, about</p> <p>10 Bernanke, RPO or DRS, are you?</p> <p>11 MR. COLLIER: Objection; form.</p> <p>12 THE WITNESS: I think ultimately the factual</p> <p>13 issue about whether those were sufficient in</p> <p>14 order to provide enough information to the</p> <p>15 client -- to the market about those rules is the</p> <p>16 scope of other experts' testimony. That is not</p> <p>17 the central part of my testimony.</p> <p>18 Ultimately, as I said early on in this</p> <p>19 deposition, I do analyze the conduct, and I have</p> <p>20 to understand the conduct at issue sufficiently</p> <p>21 in order to assess whether Dr. Wiggins' claim,</p> <p>22 for example, that there is no impact of the</p> <p>23 conduct is a reasonable position to take, and</p> <p>24 whether that is based on sound application of</p> <p>25 economic principles and it also reflects the</p>
<p style="text-align: right;">Page 327</p> <p>1 there would have been no change in bidder</p> <p>2 behavior in the but-for world.</p> <p>3 I reference the academic literature</p> <p>4 describing the difficulties in measuring</p> <p>5 advertiser return on investment. I reference</p> <p>6 internal documents from Google that acknowledge</p> <p>7 that advertisers find it difficult to understand</p> <p>8 the drivers of returns.</p> <p>9 And I, I also reviewed the documents, some</p> <p>10 of the source studies that Mr. Wiggins -- that</p> <p>11 Dr. Wiggins cites in his report. There was one</p> <p>12 particular study in particular about the speed</p> <p>13 with which different advertisers or different</p> <p>14 market participants react to changes in bidding</p> <p>15 rules, and I drew very different conclusions from</p> <p>16 that literature than those that, that Dr. Wiggins</p> <p>17 drew.</p> <p>18 So it's my -- it's in the scope -- it is in</p> <p>19 the scope of what I was reviewing and rebutting</p> <p>20 with regard to Dr. Wiggins and his assertion</p> <p>21 regarding the lack of impact of the conduct at</p> <p>22 issue, because he is asserted that it was easily</p> <p>23 detectable by everybody and that everybody</p> <p>24 adjusted it instantaneously.</p> <p>25</p>	<p style="text-align: right;">Page 329</p> <p>1 facts of this case.</p> <p>2 And I concluded on that basis that -- in</p> <p>3 responding those arguments, that those</p> <p>4 disclosures were not -- whatever disclosures were</p> <p>5 made were not sufficient.</p> <p>6 BY MR. DAVIS:</p> <p>7 Q When you testified on cross that you haven't</p> <p>8 actually read any of Google's disclosures about RPO or</p> <p>9 DRS, that was true then and true now; yes?</p> <p>10 MR. COLLIER: Objection; form and outside</p> <p>11 the scope, and counsel, you're out of time. I'm</p> <p>12 going to let him answer. Go ahead.</p> <p>13 THE WITNESS: I correctly and truthfully</p> <p>14 answered your question earlier about the extent</p> <p>15 to which I reviewed those disclosure statements.</p> <p>16 MR. DAVIS: Pass him right back.</p> <p>17 MR. COLLIER: Okay, and by the way, I just</p> <p>18 announced you're out of time. If you've got a</p> <p>19 question or two, I'm not cutting you off.</p> <p>20 MR. DAVIS: No.</p> <p>21 MR. COLLIER: Okay.</p> <p>22 Dr. DeRamus, I'd like to thank you, the</p> <p>23 court reporter, the videographer, and all counsel</p> <p>24 for staying so late tonight. I appreciate you</p> <p>25 coming.</p>

<p style="text-align: right;">Page 330</p> <p>1 At this point the plaintiff states will</p> <p>2 reserve the remainder of their questions until</p> <p>3 the time of trial, and thank you very much.</p> <p>4 THE VIDEOGRAPHER: The time is 7:15 p.m.</p> <p>5 This concludes the deposition.</p> <p>6 THE REPORTER: Let me review the orders</p> <p>7 here. Mr. Davis, you want a copy of the</p> <p>8 transcript?</p> <p>9 MR. DAVIS: Yes, please. I think we have a</p> <p>10 standing order where we like magically get them</p> <p>11 the next day, but whatever is normal is fine, and</p> <p>12 if you need extra time, just let me know, and I</p> <p>13 will tell everyone to wait. Like totally fair,</p> <p>14 but yeah, whatever is normal is what we like.</p> <p>15 MR. COLLIER: And I think we needed a rough,</p> <p>16 I think a rough is what we've ordered.</p> <p>17 THE REPORTER: And then as far as the</p> <p>18 expedite?</p> <p>19 MR. DEROSE: Please.</p> <p>20 MR. COLLIER: There's your order. I</p> <p>21 wouldn't know what to say.</p> <p>22 MR. DAVIS: So I think we have a rough and</p> <p>23 an expedite as a standing order.</p> <p>24 MR. COLLIER: I think we do, too.</p> <p>25</p>	<p style="text-align: right;">Page 332</p> <p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>6 ACKNOWLEDGEMENT OF WITNESS</p> <p>7 I, David DeRamus, Ph.D., do hereby</p> <p>8 acknowledge that I have read and examined the</p> <p>9 foregoing testimony, and the same is a true,</p> <p>10 correct and complete transcription of the</p> <p>11 testimony given by me, and any corrections appear</p> <p>12 on the attached Errata sheet signed by me.</p> <p>13</p> <p>14</p> <p>15 _____</p> <p>16 (DATE) (SIGNATURE)</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>
<p style="text-align: right;">Page 331</p> <p>1 (Signature having not been waived, the</p> <p>2 video deposition of DAVID W. DERAMUS,</p> <p>3 Ph.D. was concluded at 7:15 p.m.)</p> <p>4</p> <p>5</p> <p>6</p> <p>7</p> <p>8</p> <p>9</p> <p>10</p> <p>11</p> <p>12</p> <p>13</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>	<p style="text-align: right;">Page 333</p> <p>1 E R R A T A S H E E T</p> <p>2 IN RE: State of Texas, et al, vs. Google LLC</p> <p>3 RETURN BY:</p> <p>4 PAGE LINE CORRECTION AND REASON</p> <p>5 _____</p> <p>6 _____</p> <p>7 _____</p> <p>8 _____</p> <p>9 _____</p> <p>10 _____</p> <p>11 _____</p> <p>12 _____</p> <p>13 _____</p> <p>14 _____</p> <p>15 _____</p> <p>16 _____</p> <p>17 _____</p> <p>18 _____</p> <p>19 _____</p> <p>20 _____</p> <p>21 _____</p> <p>22 _____</p> <p>23 _____</p> <p>24 _____</p> <p>25 (DATE) (SIGNATURE)</p>

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	Page 334  CERTIFICATE OF SHORTHAND REPORTER -- NOTARY PUBLIC I, Laurie Donovan, Registered Professional Reporter, Certified Realtime Reporter, and notary public for the District of Columbia, the officer before whom the foregoing deposition was taken, do hereby certify that the foregoing transcript is a true and correct record of the testimony given; that said testimony was taken by me stenographically and thereafter reduced to typewriting under my supervision; and that I am neither counsel for, related to, nor employed by any of the parties to this case and have no interest, financial or otherwise, in its outcome.  IN WITNESS WHEREOF, I have hereunto set my hand and affixed my notarial seal this 29th day of October 2024.  My commission expires: July 14, 2027   e%12445,Signature%> LAURIE DONOVAN NOTARY PUBLIC IN AND FOR THE DISTRICT OF COLUMBIA	
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	Page 335  Zeke DeRose, Esq. zeke.deros@lanierlawfirm.com October 29, 2024  RE: State Of Texas, Et Al. v. Google LLC 10/28/2024, David W. DeRamus , PH.D. (#6918935)  The above-referenced transcript is available for review.  Within the applicable timeframe, the witness should read the testimony to verify its accuracy. If there are any changes, the witness should note those with the reason, on the attached Errata Sheet.  The witness should sign the Acknowledgment of Deponent and Errata and return to the deposing attorney. Copies should be sent to all counsel, and to Veritext at (Erratas-CS@veritext.com). Return completed errata within 30 days from receipt of testimony.  If the witness fails to do so within the time allotted, the transcript may be used as if signed.    Yours, Veritext Legal Solutions	